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Abstracts 1 - 4343

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Technical Information Service, Oak Ridge, Tennessee

NUCLEAR SCIENCE ABSTRACTS

Volume 9 — **January 15 — June 30, 1955** — **No. 12B**

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INTRODUCTION

Nuclear Science Abstracts (NSA) is issued twice a month by the Atomic Energy Commission (AEC). It is intended primarily to serve scientists and engineers working within the Atomic Energy Project, by abstracting as completely and as promptly as possible the literature of nuclear science and engineering. It covers not only unclassified and declassified research reports of the AEC and its contractors, but also material in its field of interest which appears in unpublished research reports of government agencies, universities, and industrial research establishments, and in the technical and scientific journals.

DECLASSIFICATION

The issuance of these abstracts does not constitute authority for declassification of any reports.

INDEXES

Nuclear Science Abstracts is indexed by personal and corporate author, by subject, and by report number. Annual index issues are prepared for each volume. A cumulated index to Volumes 1-4 was issued as Volume 4, No. 24B, Dec. 30, 1950, covering authors, subjects, nuclides, and report numbers. The 24th number of Volumes 5, 6, and 7 contains indexes covering the individual volumes, as well as a cumulated Numerical Index of Reports covering *Abstracts of Declassified Documents (ADD)*, Vols. 1 and 2, and the previously issued *NSA* volumes. Issue 24A of Vol. 8 contains author and subject indexes and a Numerical Index of Reports for items abstracted in Vol. 8. A separate publication (TID-4000, Cumulated List of Available Unclassified AEC Reports) which will contain a Numerical Index of Reports cumulated through Vol. 8 of *NSA* is in preparation.

Each issue of Vol. 9 (1955) contains an Author Index and a Numerical Index of Reports for abstracts in that issue as well as new availability information on reports abstracted previously. Subject and author indexes, as well as a cumulation of the Numerical Index of Reports, are issued as a supplement to the 12th issue. The 24th issue will be the annual index for the volume.

Nuclear Science Abstracts carries in issues 6B, 12B, 18B, and 24B lists of New Nuclear Data in which experimental results are displayed in tabular form and arranged by element and isotope, with each entry including a reference. The listing in No. 24B is the annual cumulation. The lists of New Nuclear Data are compiled by the Nuclear Data Group of the National Research Council, Washington 25, D. C. The New Nuclear Data items are also supplied by this group on 3 × 5 in. cards for $20.00 a year domestic and about $30.00 a year foreign (air mail postage included).

AVAILABILITY

Nuclear Science Abstracts is available in single copies (regular issues are 25 cents each; index issues are priced according to size; plus postage on all issues for foreign orders) or by subscription ($6.00 a year domestic; $8.00 a year foreign) from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

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Translations. The complete series (NSF-tr) of National Science Foundation translations is available at the depository libraries. Other translations from Russian are available at the Scientific Translation Center, Library of Congress, Washington 25, D. C., and translations from other foreign languages are available at the SLA Translation Pool, John Crerar Library, Chicago, Ill. The availability of translations from these centers is indicated in the Numerical Index of Reports.

Non-AEC Reports. The AEC cannot undertake to supply reports prepared by organizations not under contract to the AEC, except to official requesters. Others should request such reports from the issuing agency indicated in the descriptive cataloging of the report, and in the Numerical Index. Foreign reports, and reports designated by an NP number, are not available from the AEC, except to official requesters. Requests directed to the originators for NP reports should give the author and title, since NP numbers are applied to such reports by the AEC for its convenience only, and may not be known to the issuing agency.

British reports (AERE series, etc.) are available for examination at the special depositories of British reports, and, if a price is indicated in the "Availability" column of the Numerical Index of Reports, they are available for purchase from British Information Services, 30 Rockefeller Plaza, New York, N. Y.

Canadian reports (AECL series) are available at the AEC depository libraries, and, if a price is indicated in the "Availability" column of the Numerical Index of Reports, they are available for purchase from Scientific Document Distribution Office, Atomic Energy of Canada Ltd., Chalk River, Ontario, Canada. Inquiries about other Canadian reports should be made to the National Research Council, Information Services, Ottawa, Ontario, Canada.

General Information on Location of Reports. If the searcher knows the report number, he should look in the Numerical Index of Reports of *NSA*, Vol. 7, No. 24A, Dec. 31, 1953, or in the supplements in later *NSA* issues. If the searcher does not know the report number, searching is aided by the annual or cumulated subject and author indexes. The indexes refer to an abstract from which the report number may be obtained, and the information regarding availability can then be obtained from the Numerical Index of Reports. Declassified reports numbered MDDC and AECD through 2023 are indexed by subject and author in the separate *Declassified Documents Cumulated Index*, and their abstracts appear in *ADD*, the forerunner to *NSA*. These publications, as well as the first five volumes of *NSA*, are not available for sale but may be consulted at the AEC depository libraries.

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Canadian reports (AECL series) are available at the AEC depository libraries listed above.

NUCLEAR SCIENCE ABSTRACTS

Volume 9 — January 15 — June 30, 1955 — No. 12B

AUTHOR INDEX

For each reference the digit preceding the dash is the volume number and digits after the dash are the abstract number.

AARSET B
9- 250
ABBATT JOHN D
9-3012 9-3018
ABEL E
9-3078
ABOLAFIA OSCAR R
9-3452
ABOULKER J
9-2127
ABRAHAM G
9-4273
ABRAHAM S
9-2178
ABRAHAMSON S
9- 30
ABSON W
9-2415
ACCINELLI J B
9-2790 9-2791
ACKERET J
9-1014
ADAIR ROBERT K
9- 425 9- 765
ADAM J
9-2373 9-3000
ADAMS D S
9-1838 9-1847 9-3843
ADAMS H K JR
9-3871
ADAMS J A S
9- 134
ADAMS N I JR
9-4323
ADAMS W R
9-1160
ADAMSON A F
9-4181
ADDISON C C
9- 229
ADER MARIE
9- 808 9-1346
ADLAM J H
9-3987
ADLER S E
9- 276
ADLOFF JEAN-PIERRE
9-1225
ADLON T H
9- 939
ADMIRALTY CENTRE FOR SCIENTIFIC INFORMATION AND LIAISON LONDON ENGLAND
9-2237
AEBERSOLD PAUL C
9- 611
AERONAUTICAL ENGINEERING LAB PRINCETON UNIV
9-3809
AERONAUTICAL MATERIALS LAB NAVAL AIR EXPERIMENTAL STATION PHILADELPHIA
9- 171 9-3500
AEROPROJECTS INC
9-2725
AFTANDILIAN VICTOR D
9- 112
AGENO M
9-3565
AGLINTSEV K K
9-1972
AGREST M M
9-1967
AGRESTA JOSEPH
9-2849
AHAMOVSKII L M
9-1933
AHMANN D H
9- 172
AHNLUND KATARINA
9-1087 9-1088 9-1361 9-3304
AHRLAND STEN
9-2620
AIR CLEANING LAB HARVARD UNIV SCHOOL OF PUBLIC HEALTH
9- 932
AIR FORCE RADIATION LAB UNIV OF CHICAGO
9- 13 9- 14 9- 480 9-2548 9-3728 9-3729
AITKEN P B
9- 278
AJZENBERG V F
9-3628
ALABAMA UNIV
9-1555
ALAGA G
9-2501
ALBA F
9-3309
ALBANO V
9-3036
ALBERS-SCHONBERG H
9-1348 9-2482
ALBERT A
9-2429
ALBERT ROY
9-3375
ALBRECHT H O
9-2424
ALBRECHT W M
9-3118
ALBURGER D E
9- 311
ALDER F
9- 749
ALDER KURT
9-2501 9-2529
ALDERMAN ILO
9- 39
ALDERWEIRELDT F
9- 120
ALEKSEEVSKII N E
9-2320 9-2843
ALEXANDER G E
9-1944
ALEXANDER LEROY E
9-1931
ALEXANDER T K
9-2455
ALGER R S
9-2369
ALIKHANOV A I
9-1918
ALIKHANYAN A I
9-2365
ALLEGHENY LUDLUM STEEL CORP
9-2273 9-3488 9-3569
ALLEN AUGUSTINE D
9-2041 9-2200 9-3061
ALLEN BENNET M
9-1448 9-2550
ALLEN G
9- 782
ALLEN HARRY C JR
9-1136
ALLEN HERBERT C JR
9- 508 9-1975
ALLEN J S
9-2059
ALLEN K W
9- 763
ALLEN R G
9-1391
ALLEN ROBERT E
9- 233 9- 288
ALLEN S
9- 973 9-2295
ALLEN W D
9-2403
ALLIS W P
9-1304
ALLISY A
9- 320
ALLY MONA S
9-2568 9-2569
ALMQVIST E
9- 385 9- 763
ALPERUVITCH EDWARD A
9-1590 9-2787
ALPERT MORRIS
9-2651
ALPHONCE R
9-4004
AL-SALIH H ALI
9-3655
ALTMAN KURT I
9- 23 9- 486 9-2579
ALTSHULER S A
9-2074
ALTSHULLER A P
9-2868
ALTYNOV I P
9-3527
ALUMINUM RESEARCH LABS ALUMINUM CO OF AMERICA
9-1743
ALVAZYAN M T
9-1917
AMALDI E
9-1009 9-3615
AMAND G S ST
9- 495
AMBLER E
9- 354
AMBORSKI C T
9-2614
AMBOSS K
9-3560
AMBROSE P M
9-3456
AMBROSIO ALPHONSO
9-2335
AMERICAN CYANAMID CO ATOMIC ENERGY DIV WATERTOWN MASS
9- 159
AMERICAN ELECTRO METAL CORP
9- 150 9-2703 9-2740 9-3165 9-3485 9-3841 9-3850
AMERICAN LAVA CORP
9-4138
AMERICAN MEAT INST FOUNDATION
9- 10
AMES D P
9- 876
AMES AERONAUTICAL LAB NACA
9-3915
AMES LAB
9- 169 9- 586 9- 802 9- 851 9- 875 9- 931 9- 989 9-1036 9-1037 9-1121 9-1212 9-1213 9-1219 9-1247 9-1302 9-1461 9-1599 9-1759 9-1760 9-1790 9-1994 9-2022 9-2023 9-2133 9-2362 9-2726 9-2788 9-2821 9-2951 9-3052 9-3053 9-3170 9-3242 9-3444 9-4266
AMES S L
9-1538
AMHERST COLL
9-2677
AMMARELLER S
9- 194
AMPHLETT C B
9-3716
ANAKIN N M
9-3449
ANDERS OSWALD U
9- 292
ANDERSON ELAINE
9-1501
ANDERSON H G
9-2724
ANDERSON J S
9- 602
ANDERSON JOHN H
9-2072
ANDERSON KERMIT
9- 608
ANDERSON L C
9-1550
ANDERSON M J S
9-1796
ANDERSON M L
9- 924
ANDERSON R H
9-1579 9-1893 9-3251
ANDERSON WILLIAM JR
9- 38 9-1813

ANDERSSON GEORG
9-1468 9-369
ANDREEVA N S
9-1548
ANDREW A
9- 430
ANDREW A M
9- 711
ANDREW KENNETH F
9- 244 9-1877 9-2306
ANDREWS GOULD A
9-1169
ANDREWS H L
9-1168
ANDREWS HOWARD L
9-2892
ANDREWS R B
9-3755
ANDREWS R C
9-4122
ANDREWS ROBERT V
9-2232
ANDRIEUX J L
9-2744
ANFINSEN CHRISTIAN B
9-1229
ANIANESON GUNNAR
9-2871
ANNIS M
9-1061
ANSELL G S
9-4164 9-4165
ANSELONE P M
9- 368
ANSON J H
9-1368
ANTA M C
9- 581
ANTHONY J P
9-3600
ANTONOVA I A
9-2953
APPAPILLAI V
9- 326
APPLIED MATHEMATICS AND STATISTICS LAB STANFORD UNIV
9-3209
APT L
9-2870
ARAUJO J M
9-1141
ARBITER WILLIAM
9-2740
ARBMAN E
9-3690
ARCHARD G D
9-3581
ARCOS CORP
9-1860 9-2734
ARGERSINGER W J JR
9-3795
ARGO H V
9-4291
ARGONNE CANCER RESEARCH HOSPITAL
9-3748
ARGONNE NATIONAL LAB
9- 3 9- 127 9- 340
9- 434 9- 606 9- 618
9- 817 9- 925 9- 930
9- 988 9-1231 9-1804
9-2500 9-2538 9-2539
9-2547 9-2691 9-2949
9-3501 9-3786 9-4074
9-4237
ARIMA AKITO
9-3634
ARIYAMA KANETAKA
9-1558 9-1626
ARKANSAS UNIV COLL OF ARTS AND SCIENCES
9-4101
ARKANSAS UNIV ENGINEERING EXPERIMENT STATION
9-1578 9-1579 9-3918
9-3919
ARKHARAB V I
9- 642
ARMANTROUT C E
9-2760
ARMBRUSTER RAYMOND
9-2010
ARMOUR RESEARCH FOUNDATION
9- 180 9- 975 9- 978
9-1530 9-1534 9-1541
9-1842 9-1843 9-1844
9-1845 9-1850 9-2293
9-2386 9-2719 9-2721
9-2728 9-2736 9-2945
9-3166 9-3475 9-3481
9-3484 9-3486 9-3489
9-3493 9-3499 9-3516
9-3517 9-3520 9-3524
9-3549 9-3651 9-3653
9-3654 9-4104
ARMY INST OF PATHOLOGY
9-2535
ARMY MEDICAL RESEARCH LAB FORT KNOX
9-1035 9-1710 9-1783
9-2826 9-3345 9-4043
ARNASON T J
9-2576
ARNOLD ARTHUR
9- 831 9- 832 9- 833
ARNOLD JAMES R
9-3655
ARNOLD W H
9-1058
ARNOWITT R
9-2998
AROND L
9-3888 9-3889
ARONS ISIDORE
9- 839
ARONS WALTER L
9-1465
ARONSON R
9-1106 9-1107
ARPIARIAN NOUBAR
9- 841
ARROTT A
9-4209
ARTHUR G
9-3534
ASANO SUMITADA
9- 431
ASARO FRANK
9- 806 9-1633 9-4020
9-4319 9-4320
ASH E A
9-3569
ASHKIN J
9-1111 9-1341
ASHWELL GILBERT
9- 38
ASKARYAN G A
9- 458
ASKEY C M
9-2469
ASKOWITH JOSEPH G
9-1926
ASPREY L B
9-3802
ASSAYAG PIERRE
9-4201
ATEN A H W JR
9- 447
ATHAVALE V T
9- 81 9-2165
ATKINS K R
9- 663 9-2392
ATOMIC ENERGY MEDICAL RESEARCH PROJECT WESTERN RESERVE UNIV
9- 17 9- 18 9-3047
9-3378
ATOMIC ENERGY PROJECT UNIV OF CALIF LOS ANGELES
9- 6 9- 37 9- 106
9- 700 9- 701 9- 846
9-1042 9-1462 9-1488
9-1764 9-1966 9-2164
9-2334 9-2550 9-3005
9-3033 9-3753 9-4056
ATOMIC ENERGY PROJECT UNIV OF ROCHESTER
9- 19 9- 62 9- 481
9- 847 9- 916 9-1157
9-1728 9-2521 9-3010
9-4045 9-4048 9-4049
9-4050 9-4055 9-4076
ATOMIC ENERGY RESEARCH ESTABLISHMENT HARWELL BERKS ENGLAND
9- 74 9- 97 9- 170
9- 230 9- 269 9- 270
9- 294 9- 295 9- 296
9- 297 9- 694 9- 874
9- 906 9- 937 9-1034
9-1080 9-1096 9-1097
9-1699 9-2415 9-2445
9-3443 9-3551 9-3587
9-3755 9-3776 9-3789
9-3818 9-3912 9-3920
9-3962 9-3963 9-3964
9-3974 9-3987 9-3988
9-4128 9-4206 9-4227
9-4244 9-4265
ATOMIC WEAPONS RESEARCH ESTABLISHMENT ALDERMASTON BERKS ENGLAND
9- 35 9-2631
ATTERLING HUGO
9-1412 9-1413
ATTIX FRANK H
9-1331 9-2045
ATWOOD K C
9- 826
AUCLAIR JEAN MICHEL
9-1093
AUER H
9-4192
AULT G M
9- 198
AUSTIN JERE C
9- 610 9-1315
AUXIER JOHN A
9-2109
AVAN LOUIS
9-1300 9-2813
AVAN MADELEINE
9-1300 9-2813
AVERBACH B L
9- 972 9- 973 9-2294
9-2295
AVES R
9-3257
AVIGNON PAUL
9-2954
AVIGNON YVETTE
9-3235
AXEL PETER
9-3334
AYER H E
9- 496
AYNSLEY E E
9-2220 9-3419
AYSCOUGH P B
9-3085
AZIZ P M
9-2257
AZUMA TOSHIO
9- 446 9-3969

BAAK TRYGGVE
9-1471
BAARLI JOHAN
9-3093
BABB A L
9-2873
BABCOCK AND WILCOX CO
9- 939
BACHELET F
9-1570
BACHELET MAURICE
9-2684
BACHMAN BETTY L
9-2550
BACHMAN C H
9-1333 9-4127
BACHMAN GEORGE O
9-2263 9-2709
BACHMAYER K
9-3064
BACHOFER C S
9-2571
BACKENSTO A B
9-4163 9-4164 9-4165
BACKENSTO A B JR
9-2716
BACKENSTOSS G
9- 791 9- 809
BACKOFEN E W
9-2971
BACKUS J K
9- 859
BACKUS MILO M
9-4234
BAENZIGER N C
9- 110
BAERTSCHI P
9-3429
BAGLIONI T
9- 8
BAGNALL K W
9-2219 9-4098
BAILAR JOHN C JR
9-2625
BAILEY PERCIVAL
9- 831 9- 832
BAILEY T L
9-2471
BAIN OSIAS
9-3078
BAINBRIDGE K T
9-1341
BAKER B E
9-1504
BAKER ELTON M
9- 305 9-3940
BAKER HELEN S
9-3359 9-3360
BAKER J M
9-3627
BAKER JAMES A
9-2930
BAKER MELVIN C
9-4072
BAKER PHILIP S
9- 921
BAKER R C
9- 164
BAKER S J
9-1177
BAKER W H
9-2672

BAKISH ROBERT
9-2765
BALDIN A
9-1984
BALDWIN G C
9-1370
BALDWIN WILLIAM M JR
9- 181 9- 967 9-2285
9-3458
BALENT RALPH
9-4285
BALFOUR J G
9- 684
BALI T
9- 827
BALL CON O T
9- 829
BALLAM J
9-1058 9-1989
BALLANTINE DAVID S
9-1781 9-1785 9-4100
BALLARIO C
9-3255
BALLASS J I
9-2783
BALLIN JOHN C
9- 13 9-3728
BALLISTIC RESEARCH LABS
ABERDEEN PROVING
GROUND
9-1018
BANERJEE GURUPADA
9-2168 9-2641 9-2642
9-3782 9-4079
BANERJEE M K
9-1636
BANERJEE T
9- 528
BANIKIOTES G C
9-1426
BANISTER C G
9-3443
BANKS CHARLES V
9-1759 9-2155 9-4081
BANKS FLOYD R JR
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INST
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CO
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BOARTS R M
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BUREAU OF MINES
9-2724 9-3858 9-4167
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BURGESS H
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BURGOS MARIO H
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BUSTRAAN M
9-1081
BUTEMENT F D S
9- 436 9-3917
BUTLER J
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BUTSLOV M M
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BUTTRAM H J
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BUZZARD R W
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BUZZELL ANNE
9-2106
BYERLY WARD M
9-2633
BYRN E E
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BYRNES VICTOR A
9-3026
BYROM J P
9-2446
BYRON E S
9-1276

C PRIETO FERNANDO E
9-1115
CADMAN R O L
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CAGLIERIS ALBERTINA
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CAHN J H
9-3523
CAHOON HAROLD P
9-2731
CALDECOTT RICHARD S
9- 463 9-3369
CALDECOURT V J
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CALDIROLA P
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CALDWELL DAVID O
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CALDWELL R L
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CALIFORNIA INST OF TECH
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CALIF UNIV BERKELEY
9-4061 9-4184
CALIFORNIA UNIV LOS ANGELES
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CALKINS G D
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CALLAGHAN EDMUND E
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CALLERY CHEMICAL CO
9- 51 9- 52 9- 98
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CALLON PIERRE
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CALVIN M
9- 48 9- 123 9- 506
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CAMBI LIVIO
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CAMERON A E
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CAMILLI ELENA
9- 621 9-1626 9-3461
CAMIN LABS INC
9-3495
CAMPBELL DONALD R
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CAMPBELL GEORGE W JR
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CAMPION P J
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CANDLIN D J
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CANNON H S
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CANNON W B
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CAPPS R H
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CAPRON P C
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CARBIDE AND CARBON CHEMICALS CO K 25
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CARBIDE AND CARBON CHEMICALS CO Y 12
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CARLESON B G F
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CARLESON GORAN
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CARLSON B
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CARLSON J GORDON
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CARLSON R L
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CARLSON R R
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CARLSTON RICHARD C
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CARNEGIE INST OF TECH
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9- 777 9- 800 9- 971
9- 977 9-1108 9-1271
9-1533 9-3171
CARNEGIE INSTITUTION OF WASHINGTON
9- 354
CARNIGLIA STEPHEN C
9-3800 9-3801
CAROTHERS E L
9-1172
CARPENTER ARTHUR W
9-2826
CARPENTER O R
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CARRIER G F
9- 136
CARROLL W R
9- 859
CARSON W N JR
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CARSTOIU ION
9-1494
CARTER GILES F
9- 544

CARTER R E
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CARTLEDGE G H
9-1825
CARWILE NESBIT L
9-3205
CASARETT LOUIS J
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CASE INST OF TECH
9- 967 9-1646 9-2285
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CASE K M
9- 347 9-1938
CASE S L
9- 633
CASLER J A
9-1424
CASSATT W A
9- 293
CASSATT WAYNE A JR
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CASSEN BENEDICT
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CASTAGNOLI C
9-1009 9-3615
CASTELFRANCO J
9-3450
CATER FRED W JR
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9-4153 9-4154 9-4155
CATHCART J V
9-4096
CATHEY L
9- 298
CATLIN J P
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CAUCHOIS YVETTE
9-2081
CAVANAGH R L
9-2238
CAWTHORNE E W
9-1871
CAYREL ROGER
9-2079
CELLINI R FERNANDEZ
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CENTRE DE PHYSIQUE NUCLEAIRE DE L UNIVERSITE LIBRE DE BRUXELLES
9-2707 9-2851 9-2852
9-2853 9-2913 9-2928
CERESNA IVAN
9- 289
CERINEO MIHO A
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CERNIGOI C
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CERTAINE J
9-1107 9-2031
CERTAINE JEREMIAH
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CERULUS FRANS
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CERVASI M
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CHACKETT G A
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CHACKETT K F
9-3305
CHAIKOFF I L
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CHAKRAVARTI P B
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CHALK RIVER PROJECT CANADA
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CHALLENGER GEORGE E
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CHALLIS H J G
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CHALMERS B
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CHALMERS BRUCE
9-2305
CHAMBERLAIN O
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CHAMBERS DAVID H
9-1895
CHAMPION W R
9-2514
CHANG H C
9-2727
CHANG SHERMAN S M
9- 25
CHANG WEN H
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CHANNICK BERTRAM
9-2603
CHANSON P
9-3562
CHAPIN E J
9-2246 9-2247 9-2248
CHAPMAN WILLIAM H
9- 15 9- 477
CHAPPELL D G
9- 35
CHARLESBY A
9- 130 9- 203 9-2662
9-2805 9-3896
CHARPAK G
9- 442 9-2961
CHARTRES B A
9-1693
CHASE D L
9-3518
CHASE ROBERT L
9-1588
CHASSON ROBERT L
9-1004
CHASTEL R
9- 720 9-3599
CHATTERJEE G P
9-3884
CHATTERJEE S
9-1932
CHEDIN JEAN
9-2140
CHELEMER HAROLD
9-1807
CHEMICAL AND RADIOLOGICAL LABS ARMY CHEMICAL CENTER
9-3923
CHEMICAL CORPS CAMP DETRICK
9-4041
CHEMICAL CORPS MEDICAL LABS ARMY CHEMICAL CENTER
9- 844 9- 914 9-3069
9-3359 9-3360 9-4054
CHEMICAL RESEARCH LAB METAL HYDRIDES INC
9- 600
CHENG K L
9-2172
CHENG KUANG LU
9-1201
CHERNYL G G
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CHESNUT D
9-3100
CHESTON W B
9-1335 9-1647
CHETHAM-STRODE A JR
9-4320
CHEVALLIER PIERRE
9-2010
CHIAROTTI G
9- 286
CHIBA R
9- 384
CHICAGO DEVELOPMENT CORP
9-4107
CHICAGO UNIV
9- 13 9- 14 9-3728
9-3729
CHIFFELLE THOMAS L
9-3360
CHIKOVANI G E
9- 331
CHILASHVILI O A
9- 380
CHILDERS H M
9-1602
CHILDS B G
9- 204 9-3243
CHILTON E G
9-2699
CHIN DORIS M
9-2198
CHINN HERMAN I
9- 16
CHIZHIKOVA Z A
9-1758
CHODOROW M
9-3308
CHOQUET ANDRE
9-2315
CHOU C N
9-1929 9-4221
CHOWDHURY AMALENDU
9- 728
CHRIST C L
9-3437
CHRISTENBERRY KENNETH W
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CHRISTENSEN CARL J
9-2731
CHRISTIAN RUSSELL H
9- 265 9-3876
CHRISTOPHERSON E W
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CHRISTOPHERSON WILLIAM M
9-1457
CHRISTY R F
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CHU J C
9-4237
CHU JOHN T
9-3585
CHU TSAI
9-1924
CHURCHILL J L W
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CHURCHMAN A T
9- 643 9-2324 9-3187
CHWICK ALEXANDER
9-4211
CIALELLA CARMEN
9-1307
CIBIS PAUL A
9-3026
CIESLICKI M E
9-1431
CINCINNATI UNIV
9-3386
CINI G
9-1635
CLAASSEN HOWARD H
9-2652
CLAMPITT BERT H
9- 595
CLANCY E F
9-2517 9-4021
CLARK A M
9-1729
CLARK C M
9- 475
CLARK D
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CLARK D S
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CLARK F
9-2447
CLARK F H
9-3977
CLARK G L
9-2657
CLARK JAMES
9-3359 9-3360
CLARK JOAN R
9-3437
CLARK R E D
9- 998
CLARK R G
9- 558
CLARKE E M
9- 999
CLARKE LOYAL
9-3138
CLARKE R W
9-3551
CLASS C M
9- 781
CLAUDE RENEE
9-2684
CLAUSS J K
9- 518 9-2792
CLAUTICE W E
9-1264
CLAYTON JOHN C
9-1763
CLAYTON RALPH S
9-2565
CLELAND B B
9-2145
CLEMEDSON CARL-JOHAN
9-3744
CLEMENCY C
9-2632
CLEMENTEL E
9-3618
CLEMMONS JACKSON J
9-3682
CLENDENIN WILLIAM W
9-1349
CLIFCORN L E
9-1714
CLINTON ENGINEER WORKS TENNESSEE EASTMAN CORP
9- 145 9- 656
CLOUD R W
9- 250 9-1368
CLOUDMAN ARTHUR M
9-2565
CLOUET DORIS H
9- 829
CLOUGH FRANCIS B
9-3103
CLUGSTON HELEN
9-3741
COBB CHEMICAL LAB UNIV OF VA
9-4115
COBLE R L
9-1507
COCHRAN I W
9-2817
COCHRAN R G
9- 750
COCKCROFT JOHN
9- 349
CODELL MAURICE
9- 64 9-1197 9-2632
COELHO F PINTO
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COESTER F
9- 434 9-1112

COHEN ALVIN J
9-2152 9-4103
COHEN B L
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COHEN BERNARD L
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COHEN DAVID
9- 767
COHEN E G D
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COHEN J B
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COHEN L
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COHEN M J
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COHEN MORRIS
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COHEN VICTOR W
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COLE J D
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COLE JAMES W JR
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COLE L J
9-1176 9-2600 9-3370
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COLE R D
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COLE SYBIL
9-2197
COLE T E
9- 750
COLEMAN C
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COLEMAN E W
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COLEMAN L F
9-1424
COLEMAN P D
9-2885 9-2886
COLES B R
9- 979
COLLADAY G S
9-1777
COLLEGE OF AERONAUTICS
CRANFIELD ENGLAND
9-4168
COLLIE C H
9- 764 9-3657
COLLIER D M
9- 371
COLLINS CLAIR J
9-1755 9-1756
COLLINS F C
9-1912
COLLINS JAMES A
9-1540
COLLINS JOHN G
9- 25
COLLINS T L JR
9-2401
COLLINSON J A
9-1138
COLOMBINO P
9-1069
COLOMBO S
9-3632
COLORADO UNIV
9-3759
COLORADO UNIV
ENGINEERING
EXPERIMENT STATION
9- 289
COLUMBIA RADIATION LAB
COLUMBIA UNIV
9- 731
COLUMBIA UNIV
9- 5 9- 531 9-1590
9-2706 9-2787 9-3826
COLUMBIA UNIV COLL OF
PHYSICIANS AND
SURGEONS
9- 16
COLUMBIA UNIV SCHOOL OF
MINES
9-1269 9-1861
COMBE JEAN
9-2444
COMBS ROBERT L
9- 524 9- 545
COMERFORD M F
9- 973 9-2295
COMPUTATION LAB WAYNE
UNIV
9-4299
COMSA JEAN
9- 43
COMSTOCK GREGORY J
9-3173
CONFORTO A M
9-1570
CONGDON CHARLES C
9-2553 9-2563 9-2564
9-2569
CONGER ALAN D
9- 823
CONNECTICUT UNIV
9-2613
CONNOR W S
9-1130
CONSOLIDATED VULTEE
AIRCRAFT CORP
9-1103 9-1104 9-1316
9-1375 9-2027 9-2028
9-2029 9-2030 9-2926
9-3252 9-3924 9-4114
CONTINENTAL OIL CO
9-2690
CONWAY J B
9-3498
CONWAY JOHN G
9- 360
CONWAY JOSEPH B
9- 57
COOK C F
9- 781
COOK C SHARP
9-1402
COOK CHARLES J
9-2394
COOK G B
9- 97 9-3754
COOK L G
9- 278
COOK MAURICE
9-2769
COOK MELVIN A
9- 50 9-1905 9-3210
COOK RESEARCH LABS DIV
COOK ELECTRIC CO
9-3547
COOL HARRIETT T
9-2568
COOL R
9-1366
COONS MARY C
9- 122
COOPER H G
9-2946
COOPER JOHN A D
9-3378
COOPER JOHN N
9-2026
COOPER L N
9-1997
COOPER LEON N
9- 775
COOPER W A
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COOPER W E
9-4117
COPELAND L D
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COPELAND PAUL L
9-1562
CORBEN H C
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CORBETT J D
9-3052 9-3053
CORDOVI M A
9- 222
CORINALDESI E
9- 261
CORK BRUCE
9-1388
CORK J M
9-1403 9-2972 9-4322
CORMACK A M
9- 783 9-1916 9-3310
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CORNATZER W E
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CORNELL AERONAUTICAL
LAB INC
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CORNELL UNIV
9- 186 9-4121
CORNELL UNIV GRADUATE
SCHOOL OF AERONAUTICAL
ENGINEERING
9- 177
CORNFIELD JEROME
9- 39
CORRIGAN KENNETH E
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CORRIN M L
9-1025
CORTE MICHELE DELLA
9-2414
CORTELLESSA G
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CORTESI C
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CORTH R
9-3868 9-3889
CORTINI G
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CORYELL CHARLES D
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CORYELL KIRBY C
9- 161
COSSLETT V E
9-3579
COSTRELL LOUIS
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COSYNS M G E
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COTTER GLADYS J
9-2574 9-3729
COTTIN M
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COTTINGHAM J G
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COTTS R M
9-1351
COUGHANOUR L W
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COUGHLIN JAMES P
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COUND T E
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COURVOISIER SIMONE
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COWAN C L JR
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COWAN G A
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COWAN HELEN D
9-1740
COWAN ROBERT D
9-1896
COWING RUSSELL F
9- 44
CRAIG D P
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CRAIG R S
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CRAIGHEAD C M
9- 976 9-1508 9-1851
9-1857 9-1871 9-2274
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CRANBERG LAWRENCE
9- 376
CRANDALL W B
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CRANDALL WALTER E
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CRANE CO
9-1858 9-3176
CRANE W W T
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CRANSHAW T E
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CRASEMANN BERND
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CRAWFORD BRYCE JR
9-2183 9-3066
CRAWFORD FRANK S JR
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CREAMER ROBERT M
9-1895
CREMENS WALTER
9-4168
CREUTZ E
9-3712 9-3713
CREVECOEUR E
9-2931
CRISTIANI G
9- 286
CRNILOVIC MILIVOJ U
9-1583
CROALL I F
9-3422
CROCCO LUIGI
9-3450
CROCKER V S
9-3970
CROCKER LAB UNIV OF
CALIF BERKELEY
9-3574 9-3575 9-3576
CROFTS T I M
9-3815
CROMPTON CHARLES E
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CRONKITE EUGENE P
9-1720 9-3363 9-3739
CROOKER A M
9-2524
CROOKS DONALD D
9- 983
CROSSLEY FRANK A
9-1845 9-2719
CROUCH E A C
9-1034
CROUGH THOMAS
9-1042
CROWE KENNETH M
9- 338
CROWELL A D
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CROYE BEULAH L
9- 25
CRUFT LAB HARVARD UNIV
9-2895

CRUM R G
9- 977 9-1533
CRYOGENIC LAB OHIO STATE UNIV
9-3081
CUER PIERRE
9-2444 9-3598
CUFF F B
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CUKER E
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CULBERTSON R P
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CULCHETH LABS RESEARCH AND DEVELOPMENT BRANCH DEPT OF ATOMIC ENERGY ENGLAND
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CULCHETH LABS RESEARCH AND DEVELOPMENT BRANCH INDUSTRIAL GROUP UNITED KINGDOM ATOMIC ENERGY AUTHCRITY ENGLAND
9-1745 9-2666 9-4181
CULLER GLEN
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CUNINGHAME J G
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CUNNINGHAM B B
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CUNNINGHAM R M
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CURIE DANIEL
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CURIE IRENE
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CURR R M
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CURRAN R M
9-3528 9-4197
CURRAN S C
9- 437 9-2713
CURTIS M L
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CURTISS J H
9-4238
CUSACK N
9-2421
CUTLER IVAN B
9- 50
CUTLER JOHN L
9-1717
CUTTITTA FRANK
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CVJETICANIN DANE N
9- 909

DAANE ADRIAN H
9-2726
DABROWSKI J
9-3298
DAHANAYAKE C
9- 724
DAHL L K
9- 472
DAHLER JOHN S
9- 235
DAILEY B P
9-1771 9-2184
DAION M I
9-2365 9-3327
DALE W M
9-2199
DALEY DANIEL M JR
9- 215 9- 225 9-2299
DALGARNO A
9-1287
DALLAVALLE J M
9- 56
DALLYN S L
9-3735
DALY R T JR
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DAMGAARD EVELYN
9- 830
DAMON PAUL E
9-1047
DANDLAU CH A
9-1575 9-3561
DANFORTH W E
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DANGERFIELD A D
9-1776
DANIEL GEORGE E
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DANIEL H
9-1685
DANIEL R R
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9-3960
DANIELS EDWARD W
9-2112
DANIELS FARRINGTON
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DANIELS J M
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DANIELSON G C
9- 989 9-1302 9-2788
DANOS M
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DANS J
9-2138
DANSGAARD WILLI
9-1952
DAPPOLONIA E
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DARDEN S E
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DARNELL A J
9-2628
DAS M SANKAR
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DAS T P
9-1636
DASH J G
9-3219
DA SILVEIRA ADEL
9-3351
DATTA SACHINDRA KUMAR
9-2168 9-2641 9-2642
9-3782 9-4079
DAUDEL PASCALINE
9-4083
DAUDEL R
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DAUNT J G
9-1022 9-1288
DAUTREPPE D
9-1618
DAVENPORT A N
9-2432
DAVENPORT S J
9- 7
DAVENPORT T I
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DAVEY A R
9-2835
DAVEY PAUL OLIVER
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DAVID L
9- 982
DAVID M
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DAVID PHILIP W
9-2568 9-2569
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DAVIDON WILLIAM C
9-3350
DAVIDSON ARTHUR W
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DAVIES B P
9-2111
DAVIES G F
9-3496
DAVIES R H
9-3818
DAVIS DONALD D
9-2100
DAVIS F J
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DAVIS G E
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DAVIS H W
9-1333
DAVIS LEVERETT JR
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DAVIS MARGUERITE
9-2570
DAVIS RAYMOND JR
9-2921
DAVIS ROLAND W
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DAVIS S P
9-1670
DAVIS THOMAS P
9- 916 9-2521
DAVIS V M
9-3924
DAVIS W D
9- 969
DAVISON J P
9-1161
DAVISON S
9-1715
DAWSON J K
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DAWTON R H
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DAY EMMETT E
9-4116
DAY PAUL L
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DAY PAUL P
9-2967 9-4011

DAYTON I E
9-1114
DAZAI T
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DE ALBUQUERQUE DANILO
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DEALLER J F B
9- 703
DEAMICIS EGILDA
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DEAN C
9-1074
DEAN JOHN A
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DEANE HELEN WENDLER
9-4066
DEARNALEY G
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DEBALL N
9-1947
DEBENEDETTI A
9-1624 9-1625
DEBENEDETTI S
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DE BERNARDI E
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DE BOER J
9-3900
DE BORDE A H
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DEBRETTEVILLE A JR
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DEBS R J
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DE CARVALHO HERVASIO G
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DECIUS J C
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DECK CHARLES F
9- 930
DECKER RICHARD W
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DEESE CHARLES GLENN
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DEFENCE RESEARCH NORTHERN LAB CANADA
9-1581
DE FEYFER G D
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DEFORD DONALD D
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DEFRIES R S
9-2273 9-2720 9-3488
DE GROOT S R
9-3324
DE HOFFMANN F
9- 347
DEISSLER R G
9-4342
DE LABOULAYE H
9-2865
DE LEEMPUT VAN
9- 315
DEL RIO SANCHEZ C
9-1063
DELARIO A J
9-1458
DELAVERGNE LEROY
9-1331
DELAWARE UNIV
9- 475 9-3691
DELEVAUX MARYSE
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DELFEL NORMAN E
9-2558
DELIMARSKII K
9- 522
DELIMARSKII YU K
9-3768
DELIT MAURICE
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DELLA ROSA R J
9- 62 9-4055
DELONG H K
9-3681
DELUCA L S
9-4169
DE MARCO A
9-3255
DEMARCUS W C
9-2838
DEMEUR M
9-2936 9-3323
DEMMLER A W JR
9- 962 9-3842
DEMOS A C
9-1853
DEMRICK CARL
9-1794 9-1795 9-1796
9-1809 9-1810 9-1811
DEMUYNCK JEAN
9-1411
DENIS PIERRE
9- 366 9- 391 9- 770
9-1327 9-3577
DENISON IRVING A
9-3152

DENNIER ANDRE
9- 27
DENNIS K S
9-3113
DENNIS KENT S
9-2390
DENNIS RICHARD
9-4125
DENNIS W E
9-4180 9-4181
DENNISON DAVID M
9- 357
DENNY C B
9- 11
DENSON N M
9-2263
DENT JAMES NORMAN
9-1450
DEPARTMENT OF MINES AND TECHNICAL SURVEYS MINES BRANCH CANADA
9- 878 9-1944 9-2242
9-2260 9-2261
DEQUAL B
9-1061
DE RAAD B
9- 391 9- 770 9-3342
DERGE GERHARD
9-1467 9-1546 9-2135
DERING J
9-2131
DERINGER MARGARET K
9-2556 9-2557
DER MATEOSIAN E
9-3279
DERYAGIN B N
9-2365
DESAI U D
9- 257
DESCHNER ELEANOR E
9- 476 9-1154
DESER S
9- 740
DESESA MICHAEL A
9-2635 9-3779
DESHMUKH G S
9-2643
DE SOUSA ARTHUR
9-3401
DESPAGNAT BERNARD
9-2993
DESPREZ ROGER
9-2859
DESPREZ-REBAUD SIMONE
9-3235
DESTRO V P
9-1727
DETKOV S P
9-1883
DETLAF A A
9-1493
DETROIT ARSENAL
9-3140
DETROIT UNIV
9-3140
DE TROYER A
9-3291
DETTERMAN J S
9-3469 9-3833 9-3835
9-4147
DETWILER C G
9- 819
DEUEL H
9- 118
DEUTSCH G C
9- 198 9-4140
DEUTSCHER K
9-4213
DEVER JAMES L
9-2308
DE VILLIERS J W L
9-1595
DEVONS S
9-2877
DE VRIEND J A
9-1893
DE VRIES A E
9-2417
DE VRIES G
9-2215
DE VRIES HL
9-1286
DEWALD JACOB F
9-1911
DEWAN J T
9- 763
DEWAR MELVIN A
9-2644
DEWELL E H
9- 558
DEWEY DAVIS R II
9-1369
DEXTER A H
9-1598
DEYE R W M
9-1192 9-1210 9-2219
9-4227
DIAGUILA A J
9-1805
DIALER K
9-2205
DIAMOND H
9-1489
DICK J L
9- 119
DICK LOUIS
9-1327
DICKE R H
9- 454
DICKINSON R H
9-1267 9-2717
DICKINSON REGINALD W
9-2164
DI CORATO M
9- 260
DIECKAMP HERMAN M
9-3861 9-3914
DIEKE G H
9-2520
DIETER G E
9-3171
DIETRICH JACOB E
9- 701
DIGGES THOMAS G
9-1495 9-2309
DI GIACOMO ARMAND
9-3059
DIGIOVANNI H J
9-2855
DIGITAL COMPUTER LAB MASS INST OF TECH
9-1282
DILWORTH C
9-3957
DINGLEDY DAVID P
9-2153
DISMUKE S
9- 574
DISMUKES EDWARD B
9-2356 9-2357
DISTILLATION PRODUCTS INDUSTRIES ROCHESTER
9-4241 9-4242
DITMARS D A
9-1252
DIVISION OF ATOMIC ENERGY PRODUCTION RESEARCH AND DEVELOPMENT BRANCH WINDSCALE ENGLAND
9-3777 9-3933
DIVISION OF PRODUCTION AEC
9- 79
DIVISION OF RAW MATERIALS AEC
9- 161 9-1257 9-2708
9-3154
DIXON D
9- 804
DIXON W R
9-2938
DIZDAR ZDENKO I
9- 884 9- 910 9-1793
DMITRIEV A G
9-2069
DOBSON ERNEST L
9-2609
DOBYNS BROWN M
9- 499 9-1460
DOBZHANSKY THEODOSIUS
9- 5
DODD J S
9-1028
DODE MAURICE
9-4201
DOE WILLIAM B
9- 618
DOELL RUTH J
9-2558
DOGRAMADZI NATALIJA N
9- 861
DOHNE C F
9-1601
DOIG R S
9-3857
DOKOUPIL Z
9-3220
DOLAN T J
9- 214 9-1889
DOLAPCHIEV BL
9-1812
DOLE MALCOLM
9- 662 9-2130
DOLSEN C P
9-1426
DONALDSON J R
9- 774
DONOHUE JERRY
9-2190
DOOLEY JOHN A
9-1036
DORFMAN RALPH I
9-1165 9-1166
DORMAN L I
9-1921
DORN JOHN E
9-2732 9-2733 9-3172
9-3521 9-4184
DOTY D M
9-2116 9-2117
DOUGHERTY C M
9- 171
DOUGHERTY E L JR
9-2797
DOUGHERTY T F
9- 838
DOUGLAS A E
9-3389
DOUGLAS A S
9-2817
DOUGLAS DAVID L
9- 154 9-1822
DOUGLAS THOMAS B
9-2308
DOUGLASS CARL D
9- 488
DOW CHEMICAL CO
9- 192 9-1270 9-3870
DOW CORNING CORP
9-1767
DOWDY ANDREW H
9-3368
DOWNEY JAMES ASBURY III
9-3978
DOWNS B W
9-4337
DOYLE BARBARA
9-2659
DOYLE W L
9- 57
DRAGANIC IVAN G
9- 884 9-1793
DRAGANIC ZORICA D
9- 884 9-1793
DRESHER WILLIAM H
9-2207
DREVER R W P
9-2713
DRICKAMER H G
9-2797
DRINKER PHILIP
9-3808
DROZIN VADIM G
9- 531
DRUGAS P G
9-3501
DRUMHELLER C E
9-3175
DRUMMOND J E
9-3277
DRUMMOND WILLIAM E
9-4300
DUBLIN INST FOR ADVANCED STUDIES SCHOOL OF COSMIC PHYSICS
9- 699
DUBOIS J T
9-3275
DUBOIS KENNETH P
9- 14 9-2574 9-3721
9-3733 9-3738
DUBROW BERNARD
9-2622
DUCKWORTH HENRY E
9- 730
DUCKWORTH J W
9- 15
DUCKWORTH W H
9-1503 9-1620
DUCROT RENE
9-3045
DUERO J J
9- 964 9- 965 9-3856
DUFFEY J F
9-4169
DUGGAN H G
9- 568
DUHNKRACK G B
9-2650
DUIMIO F
9-1013
DUKE FREDERICK R
9-1219
DUKE UNIV
9- 890 9-1134 9-4331
DUKELSKII V M
9-2933
DULANEY C L
9-3756
DUMOND JESSE W M
9-1133 9-3335
DUMONT J
9-2131
DUNCAN D C
9-1524
DUNCAN R
9-1269
DUNEGAN HARRY C
9-4136

DUNHAM FRANK W
9- 228
DUNN P D
9-3967
DUNSTER H J
9-3746
DUPLAN J F
9-2595
DUPONT DE NEMOURS E I AND CO EXPLOSIVES DEPT ATOMIC ENERGY DIV
9- 153 9- 298 9-1196
9-1596 9-1598 9-1942
9-2194 9-2725 9-3925
9-3926 9-4229
DUPRAW WILLIAM A
9- 69
DUQUESNE MAURICE
9-2040
DURAND H
9- 748
DURBIN PATRICIA W
9-1477 9-1709
DURRUM EMMETT L
9-2393 9-3076
DUSAEV N M
9- 451
DUTLI JAMES W
9- 143
DUTTA AJIT KUMAR
9- 728
DUTTON FREDERIC B
9-3787
DUTTRAM H J
9-1592
DUWEZ POL
9-3141
DWORK J
9-2517
DWORKIN A S
9-3221
DWORNIK EDWARD
9-3830
DYNAMIC PROPERTIES LAB CALIF INST OF TECH
9- 634
DYRKACZ W W
9-2273 9-2720 9-3488
9-3869
DZHELEPOV B S
9-1970 9-1998
DZHELEPOV V P
9-2492 9-2932 9-3670

EAKINS J
9-3427
EASTWOOD W S
9-2067
EBEL ROBERT A
9-3162
EBERHARD PHILIPPE
9- 716
EBERLE A R
9-3070
EBERLEIN OTTO P
9-2316
EBY F S
9-1043 9-1397
ECCLES P J
9- 679 9-1301
ECKARDT DIETRICH
9-1217
ECKERT E R G
9-3137
ECKERT ERNEST R G
9-1805
EDELMAN R E
9-3447
EDEN M
9-2562
EDEN R J
9-3638
EDGELL WALTER F
9- 495 9-1770
EDGINGTON D N
9- 602
EDINGTON G M
9-2114
EDLUND T
9-1454
EDMONDS A R
9-2526
EDWARDS GERALD A
9-3799
EDWARDS JAMES W
9-4120
EDWARDS M H
9-2392
EDWARDS R B
9-1481
EDWARDS R E
9-1759
EDWARDS R R
9-1148 9-4101
EDWARDS S F
9-3708

EFFINGER R T
9-1887
EGAN W G
9-2850
EGELSTAFF P A
9- 297 9-1146
EGGLETON R C
9-3175
EHRENBERG L
9- 899 9-3030
EHRENBERG W
9-3785
EHRLER WILLIAM L
9-3753 9-4096
EHRLICH MARGARETE
9- 698 [illegible] 9-3260
EHRMAN J [illegible]
9- 706 [illegible] 9-3313
EICHBERGER L C
9-3453
EICHEL HERBERT J
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EICHELBERGER ROBERT L
9- 945
EICHHOLZ G G
9- 878
EICKNER H W
9- 651
EISBERG L M
9-2940
EISBERG R M
9-1954
EISENACHER P L
9- 299
EISENBERG I J
9- 49
EISENBERG Y
9- 239 9-1296
EISENBUD MERRIL
9-3175
EISENSTEIN J C
[illegible]-4035
[illegible]ERMANN
9-1890 9-3850
EISINGER J T
9- 701 9-3693 9-3834
EISLEY N
9-2131
EKSPONG A GOESTA
9-3325
EKSPONG G
9-4331
ELDER F R
9-1370
ELDER G E
9- 185
ELECTRICAL ENGINEERING RESEARCH LAB ENGINEERING EXPERIMENT STATION UNIV OF ILL
9-2786 9-2885 9-2886
9-3175
ELISEEV G P
9-1918 9-3959
ELKIN P B
9- 876
ELKIND MORTIMER M
9-3364
ELLINGER F H
9- 848 9-3802
ELLINGER FRIEDRICH
9- 484 9-3008
ELLINWOOD L EDWARD
9-1711
ELLION MAX EDMUND
9-4129
ELLIOTT E
9-2775
ELLIOTT J P
9-1077 9-3709
ELLIOTT JOHN B
9-3253
ELLIOTT JOHN C
9- 191 9-3181 9-3182
ELLIOTT MARY C
9-3260
ELLIOTT NORMAN
9- 996
ELLIOTT R L
9-3912
ELLIOTT RODNEY P
9-1539 9-2721 9-2736
ELLIS M E
9-2600 9-3370
ELLIS R HOBART JR
9-3311
ELLSWORTH R D
9-1798 9-1799 9-1800
9-1801 9-1802
EL-SABBAN M Z
9-2651
ELSASSER
9- 236
ELSEA A R
9-3857
EL-SHAMY H K
9-2686

ELSKEN R H
9-2678
ELSON L A
9-3013
ELSON ROBERT E
9- 904
ELTON L R B
9-3321
ELVING PHILIP J
9- 539 9- 540
ELYUTIN V P
9- 640
EMELEUS H J
9-3417
EMERY E W
9-2510
ENATSU HIROSHI
9-2007 9-3613
ENDT P M
9- 406 9- 407 9-3302
9-3303 9-3342
ENGELKE JOHN L
9-1220 9-1222
ENGELKEMEIR DONALD W
9-2500 9-3595
ENGELSTAD O D
9-1161
ENGINEERING RESEARCH INST UNIV OF MICH
9- 168 9- 639 9- 962
9-1268 9-1550 9-2275
9-2279 9-3478 9-3479
9-3483 9-3642 9-4185
ENGLER A
9-1667
ENGLISH J C
9-1596
ENGLISH JAMES A
9- 484
ENNOR W T
9-1743
ENNS J H
9- 639
ENTENMAN CECIL
9-1447
EPP E R
9-2419
EPPSTEIN J S
9-2861
EPSTEIN BENJAMIN
9-3814
ERDMAN K L
9-4312
ERDOS M P
9-1095
ERICKSON C A
9-1176
ERICKSON E
9- 622
ERICKSON E S JR
9-1911 9-1827 9-344[illegible]
ERIKSEN V O
9-4034
ERIKSSON T
9-4311
ERNST E W
9-2786
ESELSON B N
9- 243 9- 660
ESIN O A
9-1556
ESTIN R
9-2945
ESTULIN I V
9-2953
ESWARANARAYANA N
9- 83 9- 584
ETIENNE M
9- 315
ETZEL H W
9-3116
EUBANK HAROLD P
9- 280
EUROPEAN COUNCIL FOR NUCLEAR RESEARCH
9- 353 9- 388 9- [illegible]
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9- 393 9- 770 9- [illegible]
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9-2526 9-2527 9-253[illegible]
9-2529 9-2530 9-253[illegible]
9-2532 9-2923
EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH GENEVA
9-3577 9-3661 9-4[illegible]
9-4296 9-4297 9-43[illegible]
EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH SYNCHRO-CYCLOTRON D[illegible] GENEVA
9-3306

EVANS DORIS L
9-1208
EVANS G E
9- 992 9-1051
EVANS H B
9-4074
EVANS H D
9-2868
EVANS H T JR
9-3437
EVANS J
9-2552
EVANS JOHN E
9-2400
EVANS L F
9- 148
EVANS P B F
9-3570 9-3583 9-3584
EVANS TITUS C
9-3750
EVANS W W
9-2420
EVERHART JOHN L
9-1892
EWING CURTIS T
9- 635 9-1277 9-1466
9-1504 9-3895
EWING W W
9- 52
EXTERMANN RICHARD
9- 366 9-1327
EYERLY GEORGE B
9- 930
EYLES T E
9-1236
EYRING LEROY
9- 110 9- 111 9- 903
EZMIRLIAN FLORITA
9- 846
EZQUERRA G COMBA
9- 491

FACCHINI U
9-3949
FAFARMAN A
9-1003
FAHRENBACH W
9-2358
FAILLA G
9-3311
FAINBERG V YA
9- 329
FAIRES R A
9-3719 9-3807
FAIRHALL A W
9-3653 9-3654
FAIRSTEIN EDWARD
9-1027 9-1434
FAIVRE RENE
9-4201
FALK R
9-3029
FALK VAIRANT PAUL
9- 383 9-2897 9-2901
FAMULARO K F
9- 242 9-2073
FANGMEIER ERICH
9-4193
FANSTEEL METALLURGICAL CORP
9- 174
FARAGHAN WILLIAM G
9-2596
FARBER MILTON
9-2628
FARLEY F J M
9-2473
FARLOW NEIL H
9-1001
FARMER EARLE C
9-2847 9-2848
FARMER F T
9- 108 9- 995 9-4013
FARMER M H
9-2321
FARNEY G K
9-1396 9-2918
FARR JOHN D
9-1697
FARRAR PAUL
9-1872 9-4187
FASOLINO LUDWIG G
9-2333
FASSELL VELMER A
9-1760 9-2082
FASSELL W MARTIN JR
9- 182 9-1181 9-2207
9-3381
FAST E
9-2446
FASTOWSKY W G
9- 239 9- 240 9- 241
FAUCHER JOSEPH A
9-2648
FAUL HENRY
9- 702 9-2715

FAUPEL J H
9-3124
FAUST W R
9-3677
FAVRE R
9-1295 9-2418
FAY H
9-1557
FECHTER H R
9-3265
FEDER HAROLD M
9- 127
FEDNEVA E M
9-4065
FEDORENKO N V
9-1377 9-1378 9-2383
FEDOROV I I
9-2544
FEDOROVA Z P
9-2544
FEDOTOV P I
9-3559
FEENBERG EUGENE
9-2997
FEHER G
9-3594
FEILER CHARLES E
9-4142
FEINAUER EARL
9-1375 9-2926
FEINER F
9- 654 9-1111
FEINSILVER LEO
9-3069
FEINSTEIN ROBERT N
9-2658 9-3728
FEIRSTEIN H E
9- 552
FEITELBERG SERGEI
9-1981 9-3950
FELD B T
9-1336
FELDMAN CYRUS
9- 926 9-3908
FELDMAN G
9- 723
FELDMAN ISAAC
9-2675
FELDMAN M J
9- 567
FELDMANN F
9-1014
FELDSTED E T
9-1718
FELLAS VIAS M
9- 488
FELLINGER ROBERT C
9-2780
FENG PAUL YEN-HSIUNG
9-2664
FENNER A J
9-1498
FENSKE MERRELL R
9-2235 9-2795
FEOFILOV P P
9-1934
FERGUSON A J
9-3667
FERGUSSON G J
9-1620
FERMI E
9- 793
FERNANDEZ A
9-3309
FERNBACH SIDNEY
9-2474 9-3314
FERNELIUS W CONARD
9- 869 9-1191 9-1425
9-1752 9-3390
FERRARI F
9-1068
FERRARO JOHN R
9-2224
FERRETT D J
9-3402
FERRETTI L
9-3616
FERRETTI R J
9-4074
FERRISS DONALD P
9-3173
FERRO RICCARDO
9-2982
FERRONI S
9-1069 9-2049
FERSING LEIF
9-2779
FESHBACH HERMAN
9- 351 9-4336
FETT GILBERT HOWARD
9-3228
FEUERSTEIN W J
9-3510 9-3511
FEUVRAIS LOUIS
9-2080
FIALKOFF S
9-3495

FICKETT W
9-1896
FICKLE D P
9-1543
FIDECARO G
9-2814
FIELD A J
9-3193
FIELDS P R
9-1489
FIELDS R E
9- 425
FIELDS T H
9- 776 9- 790
FIENO DANIEL
9-1105
FILBERT R B JR
9- 548
FILIMONOV S I
9-2843
FILIMONOV V A
9- 356
FILLMORE F L
9- 430
FILOSOFO I
9-1060
FINCH L G
9-2317
FINCH W I
9-2271
FINDLAY J R
9-3789
FINDLEY WILLIAM N
9-1846 9-4157 9-4158
9-4159
FINE S
9-3227
FINKELSTEIN R J
9-2435
FINNEY CAROLINE R
9-2609
FIREMAN E L
9-2922 9-3651
FIRST MELVIN W
9- 932 9-4125
FISCHER GEORGE
9-2752
FISCHER KONRAD PETER
9-1163
FISCHER VERA KISTIAKOWSKY
9-1671
FISHER JAMES H
9-3810
FISHER P
9-2398
FISHER R W
9- 554 9- 931
FISHLER M C
9-2600
FISHMAN M
9-2577 9-2578
FITCH FRANK W
9-3738
FITCH S H
9- 774
FITZGERALD GORDON M
9-1456
FITZGERALD J J
9- 36 9- 819 9-1038
FITZMAURICE JOHN A
9- 77
FITZPATRICK H M
9-3068
FITZSIMMONS E S
9-1247
FLAHAUT JEAN
9-3119 9-3352
FLEGENHEIMER J
9- 448
FLEISCHER MICHAEL
9-1522 9-3465
FLETCHER P
9-1062
FLIKKENA D STANLEY
9- 127
FLINT G N
9-3543
FLINT O
9- 130 9- 230 9-3896
FLODMARK STIG
9-4068
FLORA J W
9- 774
FLORENCE M G
9-1669 9-3684
FLORIANOVICH G M
9- 856
FLORIDA UNIV COLL OF ENGINEERING ENGINEERING AND INDUSTRIAL EXPERIMENT STATION
9-2471
FLORIN R E
9-3054

FLOYD NEWMAN LAB OF NUCLEAR STUDIES CORNELL UNIV 9- 693
FLUGEL GUSTAV 9-1818
FLUID MOTION SUB COMMITTEE AERONAUTICAL RESEARCH COUNCIL GREAT BRITAIN 9-1803
FLYAGIN V B 9-3670
FLYNN K F 9-2174
FOCHT ELIZABETH F 9- 705
FOCK V A 9-1419
FOERING LOUISE 9-3051
FOEX MARC 9-1184
FOGLESONG G M 9-1089
FOLEY H M 9-4279
FOLGER R L 9-4286 9-4343
FOLTZ JAMES R 9-3862
FONTANA MARS G 9- 952 9-2254 9-2255 9-2259
FOOD RESEARCH INST 9- 474
FOORD T R 9-1559
FOOTE H L JR 9-1132
FOOTE MINERAL CO 9-1853
FORD G P 9- 876
FORD JOHN J 9- 875
FORD K W 9-2937
FORD M J 9- 150
FORD WILLIAM B 9-1175 9-3041
FORDHAM UNIV 9-3153
FOREMAN EILEEN E 9-3777
FOREMAN HARRY I 9-1739
FORLAND TORMOD 9-1744
FORM G W 9- 181
FORRESTAL RESEARCH CENTER PRINCETON UNIV 9- 636 9-3275
FORSCHER FREDERICK 9- 644 9-2243
FORSSBERG A 9-2124
FORSSBERG ARNE G 9-3732
FORSTER C F 9- 537
FORSTER H H 9-1124
FORSYTH P J E 9-2371
FORSYTH R H 9- 98
FORSYTH R S 9-1536
FORTESCUE P 9- 943
FORWARD F A 9- 911 9-3156
FOSTER JOHN V 9-3515
FOSTER K W 9- 54
FOUARGE I 9-4105
FOUCHER ROGER 9-1327
FOUDRIAT E C 9-1800
FOURAGE R 9- 719
FOURNEL JULIEN 9-3045
FOWLER E C 9-3270
FOWLER J F 9-4013
FOWLER J L 9-1067
FOWLER R JR 9- 154 9-1822
FOWLER W A 9-1349
FOWLER W B 9-2940 9-4257
FOX J G 9- 776 9- 790
FOX JOHN D 9-3334
FOX R J 9-2831
FOXWELL D G 9-1089
FRADKIN E S 9- 335 9-4030
FRAENKEL GEORGE K 9-2391
FRANCIS G E 9- 510
FRANCIS N C 9-3638
FRANCK E U 9- 894
FRANCOIS P E 9- 724
FRANK-KAMENETSKII D A 9-3448
FRANKEL S 9-4318
FRANZINETTI C 9-1009 9-3615
FRASER J S 9-1606
FRAZER B C 9-2413 9-3238
FRAZIER P M 9-2589
FRECHE JOHN C 9-1249
FREDERICK E J 9- 550
FREDRICKSON J W 9-2761
FREED SIMON 9- 873
FREEDMAN MELVIN S 9-2500 9-4330
FREEMAN JAMES W 9- 168 9-1268 9-2275 9-2279 9-3478 9-3479 9-3483
FREEMAN JOAN M 9-3319 9-3320
FREEMAN JOHN 9- 839
FREEMAN ROLAND 9-3115
FREEMANTLE R G 9- 410 9- 795 9-1389 9-1390
FREETH W E 9-2767 9-2768
FREIER H E 9-2166
FREIER P S 9-1335
FREMLIN J H 9-3305
FRENCH G A 9-1808
FRENCH ROBERT D 9- 50 9-3210
FRESCO JAMES 9-3375
FRICK R H 9-3935
FRICK RUTH 9-1706
FRIED S 9-3802
FRIED SHERMAN 9- 904
FRIEDELL HYMER L 9- 18 9-3047
FRIEDLANDER G 9-1366
FRIEDLANDER M W 9- 325 9-3272 9-3614
FRIEDLANDER SHELDON K 9-4125
FRIEDMAN A M 9-1469
FRIEDMAN ABRAHAM S 9-3892 9-3893
FRIEDMAN HENRY L 9-2143
FRIEDMAN JEROME I 9-3669
FRIEDMAN LEWIS 9-2840
FRIEDMAN M H 9-3348
FRIEDMAN MURRAY 9-1153
FRIEDMANN G 9-1049
FRIEDMANN NORMAN E 9-3451
FRIESEN S V 9- 322
FRIESER H 9- 308
FRILLEY MARCEL 9- 714
FRINK ELLIS P 9-2281
FRISCH D H 9-1053
FRISCH H L 9-1912
FRISKE W H 9-2246 9-2247 9-2248
FRITTS H W 9- 950
FRITZ JAMES S 9- 875
FROEHLICH FRITZ E 9-1565 9-1925
FROMAN P O 9-2502
FRONDEL JUDITH WEISS 9- 959 9-3465
FRONSDAL CHRISTIAN 9-2461
FROST PAUL D 9-2276 9-2298 9-3476 9-3480
FRUMKIN A N 9- 856
FRUNGEL FR 9- 641
FRUSH HARRIET L 9-3117
FRY W F 9- 677 9-1985 9-3236
FRY W H 9-2126
FUBINI S 9-2049
FUCHS A M 9- 287
FUCHS L H 9-2685 9-3094 9-4011
FUCHS OTTO 9-3387
FUERST CLARENCE R 9-3367
FUERSTENAU D W 9-3107
FUHRMANN HANS 9-1765
FUJIMOTO Y 9- 724
FUJIOKA GORO 9-4223
FUKUDA NOBUYUKI 9- 403
FULBRIGHT H W 9-1653
FULLER EVERETT G 9-1363
FULLER MELVIN OTIS 9- 378
FULLER R C 9- 906
FULTON GEORGE P 9- 489
FULTZ ESTHER D 9- 516
FUNK C W 9-2314
FUNK E R 9- 224
FURCHNER JOHN E 9-1711 9-3007
FURNO EDWARD J 9-2046
FURST MILTON 9-2876 9-3952 9-4316
FURTH JACOB 9- 20 9- 21 9- 827 9-1450 9-2559 9-4047

GABAY J J 9- 534
GABILLARD R 9- 353 9- 392 9-4298
GABLE R W 9- 872
GABRIELI ELEVER R 9-1717
GABRYSH A F 9-2066
GADSDEN EVELYN L 9-1450
GAIDUKOV YU P 9-2320
GAILLOUD M 9-1056
GAL I 9-1232
GALANIN A D 9- 332 9-2089 9-2090 9-2092

GALANIN M D
9-1758
GALBRAITH W
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GALLAGHAR R G
9-1325
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9-2010
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9-1170
GALULA M
9-3601 9-3641
GALULA MAGDA
9-1094
GANDELMAN G M
9-2035
GANDELSMAN A F
9-2233
GARAVAGLIA C
9- 8
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9-2111
GARCIA-PORRATA ASDRUBAL
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GARDINER LYNN
9-1829
GARDNER DWIGHT E
9-1730 9-4076
GARDNER J O
9-2657
GARDNER WELDON J
9-3862
GARELLI C M
9-1624 9-1625
GARIBOTTI D J
9- 967 9-3458
GARIBYAN G M
9- 256 9-1937
GARIFYANOV N S
9-2516
GARNER CLIFFORD S
9-1749 9-3770
GARNER W
9-2614 9-2615
GARRELS ROBERT M
9-1474
GARREN A
9-1663
GARRETT C
9-1978'
GARRETT JANE B
9-1789 9-3904
GARRIGUE HUBERT
9-1326 9-2536
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9-2197
GARTNER H
9-3016
GARVIN DAVID
9-3062
GARWIN LEO
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GARY ROBERT
9-4071
GASIOROWICZ S
9-2998
GASS HERBERT
9-1042
GATHA K M
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GATTI E
9-3307
GATTO F
9-4190
GATTO R
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GAUDIN A M
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9-3107
GAUNT J
9- 94
GAUS H
9-2015
GAUZIT MAURICE
9-1950
GAYLORD EBER W
9-1271
GEGAUFF CHRISTIANE
9-3598
GEIBIG F C
9- 221
GEIL GLENN W
9-3205
GEISLER A H
9- 189
GEISS W
9-1536
GELD P V
9-1556
GELL MANN MURRAY
9-1399 9-3702 9-4008
GELLER S
9-3878
GELORMINI O J
9-1333
GENERAL ELECTRIC CO
AIRCRAFT NUCLEAR
PROPULSION DEPT
9-2983
GENERAL ELECTRIC CO
ANP PROJECT
9-2700
GENERAL ELECTRIC
RESEARCH LAB
9- 187 9- 188 9- 189
9- 190 9-1864 9-3179
9-3180 9-3865 9-3866
9-3867
GENERAL ENGINEERING LAB
GENERAL ELECTRIC CO
9- 167 9- 272 9- 609
9-1263 9-3288
GENERAL MILLS INC
9-3720
GENIN J
9-3599
GENSAMER M
9-1269
GENTNER W
9- 809 9-3254
GENTRY GEORGE
9- 479 9-2109
GEOLOGICAL SURVEY
9- 78 9- 162 9- 880
9- 881 9-1515 9-2263
9-2709 9-3828
GEORGE E C
9-3939
GEORGE L A
9-1703
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GEORGE W D
9-4292
GEORGE WASHINGTON
CARVER FOUNDATION
9-3799
GEORGIA INST OF TECH
STATE ENGINEERING
EXPERIMENT STATION
9- 56 9-1789 9-3904
GERHART J B
9-1356
GERKEN JOHN M
9-1531
GERMAIN G
9- 770
GERMANN FRANK E E
9-3759
GERSHUNI G Z
9-3813
GERSTNER HERBERT B
9-2582 9-3727
GERTSRIKEN S
9-3875
GERTZRIKEN S S
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GERVAIS ANDRE M
9-3163
GESCHWIND S
9- 729
GEYER SAMUEL V
9-1323 9-1732
GHIGO G
9-1069
GIANNONI G
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GIBB THOMAS R P JR
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GIFFORD JOHN F
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9-2006
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9-1644
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9- 835
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GILL P S
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9- 629
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GILVARRY J J
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GINDLER J E
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GING J
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GINNINGS D C
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GINZBURG V L
9-1923
GINZTON E L
9-3308
GIORDANO G
9- 31
GITZENDANNER L G
9- 606
GIVIN H H
9-1396 9-2918
GLASCOCK R F
9-2180
GLASER DONALD A
9-2425
GLASER FRANK W
9- 150 9-3822
GLASGOW L E
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GLASS BENTLEY
9-3021 9-3023
GLASSER R G
9-1664 9-4306
GLASSGOLD A E
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GLEASON G I
9-1459
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GLENDENIN L E
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GLINES A
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GLOVER K M
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GLUCK JEREMY V
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GLUCKSMANN A
9- 821
GLUCKSTERN ROBERT L
9-2465
GLUECKAUF E
9-3392
GLUZMAN N G
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GNAGEY L B
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9-2256
GODFREY CHARLES S
9-1659
GOERTZ R C
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GOERTZEL GERALD
9-2447
GOES M L
9- 316
GOFFAUX R
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GOLD G LENNARD
9-1735 9-1736
GOLD LOUIS
9-1992 9-3676
GOLDANSKII V I
9-1920 9-2915
GOLDBERG ALFRED
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9-3819
GOLDBERG STANLEY B
9- 502 9- 503 9- 504
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GOLDBLITH S A
9-1715
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9-1079 9-2427
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9-3938 9-4318
GOLDENSTEIN A W
9- 180

GOLDHABER M
9-1355
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9-1368
GOLDMAN I I
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GOLDSCHMIDT-CLERMONT Y
9-1987
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9- 347 9- 620
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GOLDSTON PHYLLIS
9- 17
GOLDSTONE N I
9-3412
GOLDSWORTHY JOSEPH
9-1817
GOLDWASSER E L
9-1055
GOLFAND YU A
9- 329
GOLOVIN B M
9-2932
GOMBERG H J
9- 493 9-1550
GOMER ROBERT
9-2741
GOMEZ R
9-1053
GONIKBERG M G
9- 239 9- 240 9- 241
GONSHERY LEON
9- 39
GOOD R S
9-1511 9-1827 9-3462
GOOD W D
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GOOD W M
9-1364
GOODMAN CLARK
9-1071
GOODMAN E I
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GOODMAN J
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GOODMAN L S
9-2005
GOODWAY N F
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GOODWIN THOMAS C JR
9-4063
GOOGIN JOHN M
9- 524 9- 545
GORBACHEV S V
9-1195
GORBACHEV V M
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GORDON CHARLES L
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9-2546
GORDON MENDEL T
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GORDON PAUL
9-1586
GORDON SHEFFIELD
9-1135 9-2202
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GORDY WALTER
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GORMAN J G
9-1111
GORODETZKY SERGE
9-2010
GOSTEVA E A
9-2544
GOTO HIDEHIRO
9-4086
GOTO SHIGEO
9- 403
GOTT GARLAND B
9-1517
GOTTFELD F H
9-1983
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9- 86
GOTTLIEB M B
9-1928
GOTTLIEB MELVIN H
9-1750
GOTTSTEIN K
9-1557 9-2881
GOUBEAU J
9-2629
GOUDSMIT S A
9-1444
GOULD S E
9- 493
GOULOTTO L
9- 286
GOVAERTS J
9- 90 9-2387
GOVE H E
9-1092 9-2019
GOWARD F K
9-3656
GRABE BARBRO
9-4067
GRACE M A
9- 747 9-1406
GRADINGER H
9- 114
GRAFT W H
9-2293 9-2726
GRAHAM C D
9-2370
GRAHAM R H
9- 774
GRAHAM R L
9- 249
GRAND J A
9-1277 9-3895
GRAND JUNCTION
OPERATIONS OFFICE AEC
9- 160 9- 624 9-1256
9-1512 9-1513 9-1828
GRANDEY RAYMOND ALVIN
9-1108
GRANET IRVING
9-2697
GRANGER M J
9-2314
GRANT I P
9-3658
GRANT NICHOLAS J
9- 175 9-1876 9-2282
9-2727 9-3163 9-4166
GRAUE ARNFINN
9- 761
GRAUS B
9-3794
GRAVES ELIZABETH R
9-3646 9-3650
GRAVES J D
9-1602
GRAVES WILLIAM E
9-3340
GRAY A J
9-1577
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9- 502 9- 503 9- 504
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9-1753
GREATHOUSE GLENN A
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GREBE JOHN J
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9- 507
GREEN A
9-3264
GREEN ALEX E S
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GREEN D WAYNE
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GREENE S A
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GREENFIELD M A
9-2334
GREENFIELD M L
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GREENFIELD P
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GREENHALGH D
9-2408
GREENLEES G W
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GREENOUGH G B
9-2778
GREENSTREET M E
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GREENWOOD H W
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GREGOR HARRY P
9- 116 9-1750
GREGORY J N
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GREISEN KENNETH
9- 693
GREULING E
9-2447
GRIB A A
9-2698
GRIFFIN P M
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GRIFFIN PATRICIA L
9- 22
GRIFFING G W
9-2943
GRIFFITHS JOHN C
9-1826
GRIFFOUL R
9-2389
GRIGGS ROY L
9- 955
GRILLI M
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GRIMALDI F S
9- 880 9-2638
GRIMAUD A V
9- 759
GRIMELAND BERTEL
9- 697
GRJEBINE TOVY
9-4275
GRODNER A
9-1279
GROOT C
9-3825
GROS CHARLES M
9- 43
GROSHEV L V
9-3621
GROSS J H
9-4195
GROSS M R
9-2280 9-3507 9-3860
GROSSE ARISTID V
9- 57 9-3498
GROSSMAN MORRIS
9-3806
GROSSWEINER LEONARD I
9-3095
GROTDAL T
9- 410 9-2454
GROVE E L
9-4080
GROVE G R
9-2952
GROVER H J
9- 173 9-3164 9-3846
9-3855
GROVES WARREN O
9-2772
GRUBE W L
9- 689
GRUN A E
9-2477
GRUNER JOHN W
9-1514 9-1829
GRUTTER F
9-1098
GRUZ E A
9-2743
GRUZIN P L
9-1884 9-4203
GUARNIERI G J
9-3502 9-3503 9-3504
9-3505 9-3506
GUDE ARTHUR J III
9-1518 9-1519
GUDE W D
9- 492
GUEBEN G
9-2387
GUEBEN GEORGES
9-2683
GUGELOT P C
9-1114
GUHL H
9-4017
GUKHMAN A A
9-2233
GULBRANSEN EARL A
9- 244 9-1877 9-2306
GUNDZIK RICHARD M
9-4142
GUNNING HARRY E
9- 532 9-2143
GUNTHER-MOHR G R
9- 729
GUPTA J
9-3431
GUPTA K DAS
9-3697
GUPTA SURAJ N
9-1343
GUREVICH M A
9-1866
GURLAND J
9-2755
GURWITCH J G
9- 239
GURYANOVA E N
9- 64
GUSTAFSON GORDON E
9- 17
GUSTAFSON P F
9- 435 9-3591
GUSYATSKAYA E V
9-4084
GUTH E DANIEL
9- 110 9- 111
GUTMANN V
9- 892

GUTMANN VIKTOR
9-2630
GUY A G
9-3420
GVOZDOVER S D
9-2013

HAAG RUDOLF
9-2532
HAAKER L W
9- 562
HAAR ROY W VANDER
9-2155
HAAS CHARLES G JR
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HAAS L L
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HABER-SCHAIM U
9-1667
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9-2553
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9-4051
HACKMAN R J
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HADDEN F A
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HAENNY CH
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HAGEE G R
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9-3973
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9- 304
HAHN H T
9- 585
HAHN PAUL F
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HAID A
9- 66
HAIL W J JR
9-2263
HAIN K
9-1557
HAINES H R
9-2328
HAISSINSKY MOISE
9-1214 9-1215 9-1216
HALAPATZ J
9-2742
HALBAN H
9-1342
HALDEN F A
9-3821
HALEVI E A
9-3391
HALEY THOMAS J
9- 37 9-3005 9-3033
9-3747
HALG W
9-4034
HALL A M
9-3490 9-3522
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9-4057 9-4094
HALL K L
9- 293
HALL LEWIS D
9- 179
HALLDEN NAOMI
9-2065
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9-3536
HALLING J
9-2240
HALMSHAW R
9-2241
HALPERN I
9-3653 9-3654
HALPERN J
9- 911 9-3156
HALTER J
9-1409 9-4017
HAMACHER E A
9-1309
HAMANN A
9-1653 9-1946
HAMER WALTER J
9- 898

HAMERMESH MORTON
9-1112
HAMERS H C
9-2417
HAMILTON A R
9-4241
HAMILTON D C
9-1492
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9-3703
HAMILTON J L
9-1509
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9-1477 9-1709
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9-2565
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9-1235
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9-4120
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9-1908 9-4033
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9-1600
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9-2022 9-2023
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9-1715
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9- 559
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9-2354 9-2356 9-2357
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9- 754
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9-2245
HANBURY E M JR
9-1179
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9-2211
HANCOCK D A
9-2453
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HANDLEY THOMAS H
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HANDWERK J H
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HANFORD WORKS
9- 12 9- 128 9- 299
9- 368 9- 400 9- 501
9- 549 9- 585 9- 609
9- 629 9- 696 9- 942
9-1703 9-2950 9-3212
9-3752 9-3825 9-3927
HANKES L V
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HANS HARNAM SINGH
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HANSTOCK R F
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HARA REINOSUKE
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HARD A R
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HARDY H K
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HARDY W A
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9-2494
HARKLEROAD M E
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9-2763

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HEALTH AND SAFETY LAB
NEW YORK OPERATIONS
OFFICE AEC
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ILLINOIS INST OF TECH
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INSTITUTE FOR INDUSTRIAL
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JONES H H
9-1325
JONES J BYRON
9-2725
JONES JAMES JR
9- 802
JONES JAMES T JR
9-3339
JONES L V
9-2181
JONES R C
9-2790 9-2791
JONES R H
9-1901 9-1902 9-2776
JONES R W
9-3248
JONES W D
9-3790
JONES W M
9-3582
JONKER C C
9-2417
JONSSON LARS
9- 688
JORBA J P PEREZ Y
9-4282
JORDAN R D
9-2369
JORDAN W C
9-1673 9-1675
JORGENSEN CHR KLIXBULL
9-2979 9-3001
JOSEPH WALTER F
9-3937
JOSHI M C
9-1123
JOUVET BERNARD
9-1144
JOUVIN J
9-1568
JOVANOVIC DRASKO D
9-1627
JOVANOVIC VLADAN S
9-1151
JOY P F
9-3760
JUCKER H
9-1207
JUDD B R
9-2977 9-2978
JUDD J M
9-2114
JUDSON B F
9-1491
JULIAN A
9-1336
JUNG J J
9-1353
JUPNIK H
9-3712 9-3713
JURIC MIRA K
9-1379 9-1651 9-4293

KAÇANSKI KATICA L
9- 834
KADE HAROLD
9-1462
KAHAN T
9-1016
KAHN B
9-4324
KAISER E P
9- 162
KAISER H F
9- 396
KAISER WILLIAM C
9-3546
KAITMAZOV S D
9-1917
KALISH HERBERT S
9-2754
KALISHEVICH I Z
9-1239
KALKSTEIN M I
9- 803
KALLMAN D
9- 370
KALLMAN ROBERT F
9-2554
KALLMANN HARTMUT
9-2876 9-3952 9-4316
KALNAJS J
9-3408
KALOS M H
9-2362
KALOS W H
9-2095
KAMACK H J
9-3091
KAMATH S
9- 637 9-2735
KAMEN MARTIN D
9-3967
KAMKE D
9-4213
KAMMER E W
9-2098
KAMMERMEYER KARL
9- 685 9-2211
KAN B
9-1715
KANE J A
9- 654 9- 776 9- 790
KANE JAMES S
9-2823
KANE R P
9-4218
KANEKO THOMAS M
9-1181
KANENO TADASHI
9-1666
KANSAS UNIV
9-2160 9-3795
KAPADNIS D G
9-3220
KAPLAN EZRA
9- 503
KAPLAN HENRY S
9-2558 9-2596 9-2597
KAPLAN IRVING
9-4271
KAPLAN LOUIS
9- 541 9-3057
KAPLAN SYLVAN J
9- 4 9- 476 9- 479
9-2109
KAPLON M F
9-1299 9-1927 9-2815
KAPLOW R
9-2294
KAPRIELYAN S P
9-3482
KAR B C
9-2171
KAR K R
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KARD P G
9- 459
KARNOVSKY MANFRED L
9-4066
KASSNER D
9-1366
KASSNER JAMES L
9-4080
KASTENBAUM MARVIN A
9-2586
KASYANKOV P P
9-1939
KATSUMORI HIROSHI
9- 352 9-1621
KATTI P K
9-1906
KATTNER L E
9- 549
KATZ ELAINE J
9-2566
KATZ JOSEPH
9- 501 9-2178
KATZ JOSEPH J
9-1135 9-2685 9-3839

KATZ LEWIS
9- 905
KATZ N H
9-4140
KATZIN LEONARD I
9-2224
KAUER E U
9-4190
KAUFMAN I
9-2885 9-2886
KAUFMAN J G
9-1533
KAUFMAN JOYCE J
9-1203
KAUFMAN SAMUEL J
9-3125
KAVANAGH R W
9-2064
KAVETSKIS V I
9-2086
KAWAGUCHI MASAAKI
9-2044
KAWAGUCHI OSAMU
9- 404
KAWANISHI ROKURO
9-4199
KAWAY MITSUJI
9- 404
KAYE W I
9-2672
KAZARINOV YU M
9-2492 9-3670
KAZEN D
9-2945
KEARNS W H
9-1839 9-1849 9-3491
KEATING D T
9-2947
KEE W A
9- 156
KEEFE D
9- 325 9-3272 9-3614
KEELER J H
9- 189 9- 190 9-2762
9-3179 9-3180
KEEN R D
9- 139
KEENAN ARTHUR G
9-1741
KEENAN C W
9- 515
KEENAN THOMAS K
9-4112
KEEPIN GEORGE ROBERT JR
9-1943
KEESOM P H
9- 990
KEHL G L
9- 981 9-2339
KEHL GEORGE L
9- 646
KEHOE J W
9-2313
KEHOE R B
9- 690
KEILY HUBERT J
9-3396
KEIM C P
9-2402
KEISCH B
9- 534
KEISTER G L
9-2507
KEITH J N
9-1741
KEITH ROBERT E
9-4185
KELLER SEYMOUR P
9-3682
KELLER WILLIAM E
9-1907 9-1908
KELLEY DANA R
9-1512
KELLEY JOHN P
9-2046
KELLIHER MAURICE G
9-1369
KELLOGG JOHN P
9- 160 9- 624
KELLOGG M W CO
9-3810
KELLY A
9-3190
KELLY EMERSON W JR
9-3133
KELLY F M
9-2341
KELLY SHERWIN F
9-2266
KELLY W H
9-2062
KELMAN L R
9-3501
KELMAN V M
9- 451
KEMPE L L
9-1550

KENAHAN CHARLES B
9-3151
KENNEDY J M
9- 812
KENNEDY JOSEPH W
9-2664
KENNEDY ROBERT J
9- 314 9-2047
KENNEDY WILLIAM R
9- 701 9-1966
KENT B H
9-3468
KENT EDWARD M
9-1175 9-3041
KENT T B
9-4233
KENTUCKY RESEARCH FOUNDATION UNIV OF KY
9-1838
KEPHART JOHN F
9-1600
KEPP R K
9-2601
KEPPEL ROBERT E
9-3578
KEREIAKES J G
9-1783
KERIMOV B K
9-2000
KERMAN R O
9-1394
KERN B D
9-1396 9-2918
KERNAN A
9-3272
KERNS Q A
9-1438
KERR EUGENE C
9- 666
KERRIDGE D H
9- 229
KERRIGAN JAMES C
9-3923
KERWIN LARKIN
9-1032
KESSLER HAROLD D
9-1841 9-1842 9-1843
9-1844 9-2719 9-2749
9-3475 9-3520 9-3849
KETLEY ARTHUR D
9-2646
KETRON C V
9-2404
KEUFFEL J W
9- 303
KEYWELL FRANK
9-3898
KHIMII FIZICHESKOI
9-4143
KHODOSEVICH P K
9-2544
KHOLNOV YU V
9-1970
KHOLNOVA E A
9-1972
KHOZYAINOV V T
9- 816 9-1338
KHROMCHENKO L M
9-2008
KIBARTAS V V
9-2087
KIHARA TARO
9-3911
KIKUCHI KEN
9-3619
KIKUCHI RYOICHI
9- 667
KILLEEN JOHN
9-2930
KILLIAN LEO G
9-3547
KILPATRICK JOHN E
9-1908 9-4033
KILPATRICK MARTIN
9- 866 9- 867 9-1741
KILPATRICK MARY
9-1741
KIMBALL A W
9- 825
KIMBALL R F
9-2584
KIMELDORF D J
9- 462 9-2111
KINCHIN G H
9-3328 9-4012
KINDERMAN E M
9- 570
KING CECIL V
9- 121
KING D T
9-1631 9-3611
KING E C
9- 605 9-4122
KING EDWARD D
9-3027
KING N M
9-1287
KING R
9-2305
KING R W
9- 805
KINGERY W D
9- 653 9- 946 9-1505
9-1507 9-2702 9-2793
9-3821
KINGSBURY E
9- 961
KINNUNEN JORMA
9- 543
KIRAKOSYAN Z A
9-1917
KIRBY H W
9-2054 9-2399 9-3793
KIREEV V A
9- 63
KIRILLOV V V
9-1493
KIRILLOV-UGRAYUMOV V G
9-2365
KIRK DONALD
9-1020
KIRK W
9-4187
KIRKWOOD JOHN G
9- 995
KIRSHENBAUM ABRAHAM D
9-3394
KIRZHNITS D A
9- 330
KISELEV A V
9- 915
KISHINEVSKII M KH
9-1791
KISLIUK P
9-2376
KISSINGER CHARLES W
9- 273
KISTEMAKER J
9-2417
KISTIAKOWSKY G B
9-2624
KISZKA J C
9-3509
KITT G P
9-3392
KITTEL J H
9- 564 9-3264
KITTO P H
9- 607
KLAUS E ERWIN
9-2795
KLEIN J RAYMOND
9-1155 9-2580
KLEINBERG JACOB
9- 876
KLEINER W H
9-2487
KLEMIC HARRY
9- 164
KLEMM ALFRED
9-1954
KLEMPERER WILLIAM
9-3084
KLEPIKOV N P
9- 414
KLEPP H
9- 749
KLEVIN PAUL
9-3375
KLINE R M
9-1680
KLINE RAYMOND MILTON
9-2951
KLINGLER QWENTIN G
9-1742
KLINGMAN DONN W
9-4081
KLINKENBERG A
9- 140
KLINKENBERG P F A
-4024
KLINKHAMER J
9-2228
KLUG HAROLD P
9-1931
KLUYVER J C
9-3302 9-3303
KMETKO E A
9- 262
KNAPP MYRON WILLIAM
9-2914
KNAUER ISABELLE S
9-2129
KNIGHT W D
9-1351 9-3594
KNISELEY RALPH M
9-1169
KNOLLS ATOMIC POWER LAB
9- 36 9- 154 9- 172
9- 272 9- 300 9- 369
9- 428 9- 819 9- 969
9-1038 9-1118 9-1308
9-1317 9-1582 9-1655
9-1822 9-2162 9-2517
9-2655 9-2689 9-2827
9-2927 9-3098 9-3121
9-3286 9-3287 9-4010
9-4075 9-4117 9-4169
KNOX FRANK A
9- 145
KNOX WILLIAM J
9- 778
KOBAYASHI JUN-ICHI
9-4066
KOCHARYAN N M
9-1917 9-1922 9-3907
KOEHLER J S
9-2946
KOEHLER W C
9-3344
KOEMEN H
9- 66
KOESTER LOUIS J JR
9-4260 9-4261
KOETSCHET PIERRE
9-3045
KOFOED-HANSEN O
9-1044 9-2503 9-4252
KOFSTAD PER K
9-2060
KOHL A
9-3064
KOHLER G D
9-3938
KOHMAN TRUMAN P
9- 953 9-1661 9-2265
KOHN HENRY I
9-2554 9-3038
KOJAN SELMA
9-3718
KOJIMA SHOJI
9-1303
KOLBE CARL L
9- 984
KOLBE E
9-3421
KOLEBATOVA V S
9- 538
KOLESNIKOV N
9-3620
KOLETSKY SIMON
9- 17
KOLK ANTHONY J
9-3848
KOLSKY HARWOOD G
9-3811
KOLSKY MADELEINE
9-3045
KOMAREK K
9- 883
KOMATSU KOZO
9-3067
KOMODA TSUTOMU
9-2653
KOMPANEETS A S
9- 456
KONAREV M I
9- 70
KONECCI EUGENE B
9-2110
KONOPINSKI E J
9-3968
KONYUKOV M V
9-1573
KOOI J
9-3110
KOONTZ P G
9-1943
KOPPE E F
9- 622 9-1511 9-1827
9-3462
KORENMAN I M
9-1216
KORFF S A
9-3564
KORN T MARC
9- 865
KOROLEV A M
9-2018
KOSHIBA M
9-1927
KOSHLAND D E JR
9- 473
KOSKELA URPO
9-2633
KOSKI W S
9-1203
KOSMACHEVSKII V K
9-3959
KOSONOGOVA K M
9-3761
KOSOUROV G I
9-2843
KOSTOGONOV V G
9-4203
KOTFILA RALPH J
9-3183
KOUTECKY J
9-4064
KOUZOV P A
9-3361

KOVARIK A F
9-4323
KOVDA A V
9-3959
KOWALCZYK L S
9-3140
KOWALSKY ARTHUR
9- 473
KOWLESSAR O D
9- 23 9-2579
KOYAMA KARL
9-3397
KOZENY JOSEF
9- 236
KOZINA N A
9- 642
KOZLOV B K
9-2234
KOZODAEV M S
9-3607
KRAEMER HERBERT F
9- 934
KRAFT LISBETH M
9-3737
KRAITCHMAN J
9-2184
KRAMER P
9-3341
KRASNOW M E
9-3696 9-3994
KRAUS DAVID
9-3761
KRAUS KURT A
9- 525 9-1226 9-2212
9-2213 9-3102 9-3103
KRAUTMANN H
9-3421
KRAVTSOV V A
9- 744 9-3284 9-3343
KRAYBILL H L
9-3270
KREBS A T
9- 444 9-1035 9-1783
9-4043
KREBS K
9-2525
KREGER W E
9-1402 9-1672
KREIDL NORBERT J
9-1040 9-2051 9-3932
KREMER D A
9-2054
KREPELKA SVATOPLUK
9- 882
KRESTNIKOV YU S
9-2422
KRIER C A
9- 637 9-2735
KRISHNAN K S
9-1564
KRISHNASWAMY N
9- 913
KRISHTAL M A
9-1869
KRIVOBOK V N
9-2315
KROHN L H
9-2826
KROHN V E
9-3278 9-4321
KROLAK LEO J
9- 916 9-2521
KRONHEIMER ERWIN H
9-1695
KROPVELD R E W
9-4018
KROTOV I V
9-1194
KRUECKEL BARBARA J
9-2608 9-3377
KRUGER HUBERT
9-4277
KRUGER P GERALD
9-1394
KRUMHOLZ LOUIS A
9-1445
KRUSCHWITZ HENRY W JR
9- 600
KRUSE U
9-2039
KRUZHILIN G N
9-1809 9-1810
KRYLOV E I
9- 538
KRYUCHIN A F
9-1243
KRYUGER G
9-3074
KUBO RYOGO
9-1628 9-1629
KUDIELKA H
9-1010
KUDO SHOKO
9-1566
KUHLMAN C W JR
9- 601
KUHN W
9-3429
KUHN WERNER
9-3797
KUHNS L J
9- 98
KULIKOV A M
9-3905
KULP B A
9-3523
KULP J LAURENCE
9-1000 9-2004
KUMABE ISAO
9-1330
KUNIN ROBERT
9-3106
KUNKEL ANNE M
9- 844
KUNKEL W P
9-2027 9-2030
KUNZ W E
9-1364 9-2451
KUPER A
9-1278
KURA J G
9-1528
KURBATOV M H
9- 119
KURIYAMA KATSUMI
9-4250
KURODA P K
9-1148
KURSUNOGLU BEHRAM
9-1696
KURTEPOV M M
9-1685
KURTI N
9- 747
KURY JOHN W
9-3055
KUSANO NOBUO
9-3745
KUSHNERIUK S A
9- 346
KUSMIEREK B
9-1715
KUTZ EUGENE R
9-1175 9-3041
KUZNETSOV G M
9-3552
KYHL R L
9- 772 9-3308
KYKER GRANVIN C
9-1725

LABATON V Y
9-3385
LA BELLE CHARLES W
9-1731
LABERRIGUE-FROLOW JEANNE
9-2504 9-2955 9-2959
9-2963
LABORATORIES FOR
RESEARCH AND
DEVELOPMENT FRANKLIN
INST
9-1855 9-1862 9-3174
LABORATORY FOR
INSULATION RESEARCH
MASS INST OF TECH
9- 342 9-3408
LABORATORY FOR MAGNETICS
RESEARCH CARNEGIE
INST OF TECH
9-4209
LABORATORY FOR NUCLEAR
SCIENCE MASS INST OF
TECH
9-1066 9-1071 9-1139
9-2331 9-4205
LABORATORY OF CARL A
ZAPFFE AND ASSOCIATES
9- 963
LABORATORY OF MOLECULAR
STRUCTURE AND SPECTRA
UNIV OF CHICAGO
9-4239
LABRIE ROGER J
9-2223
LACASSAGNE A
9-2595
LACHANCE LEO
9-3736
LAD ROBERT A
9- 951
LADANY I
9- 313
LADU M
9-1569 9-2917
LAFFERTY D L
9- 419
LAGERQVIST A
9-1228
LAHR T N
9-1459
LAI J R
9- 658
LAIDLER KEITH J
9- 104

LAING E W
9-3701
LAITINEN H A
9-2625
LAITY RICHARD W
9-1219
LAJTHA L G
9-3011
LAKIN W
9-4283
LAL D
9-1049 9-3960
LALOVIC BRANISLAV I
9-1048 9-1609
LAMBERT V E
9-1276
LAMBERTSON GLEN R
9-3663
LAMBERTSON WINGATE A
9- 925 9- 930
LAMERTON L F
9-2119 9-3050
LANCASTER C J
9-3459
LANDAU L D
9-2032
LANDECKER K
9-1577
LANDENBURG R
9-3557
LANDIS FRANK P
9- 122
LANDON H H
9-1132
LANDON P R
9-3172
LANDRY J W
9- 568
LANE A M
9-1077 9-3320 9-3624
9-3625 9-3645
LANE G A
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LANE JAMES A
9-1642
LANE JOHN J
9-2572
LANG E J
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LANGE ARTHUR H
9-3753 9-4056
LANGER L M
9-1676
LANGEVIN H
9-3694
LANGEVIN MICHEL
9- 807 9-2070 9-2956
LANGSTON B G
9-4145
LANYON M A H
9-2159
LANZI G
9- 286
LANZL LAWRENCE H
9-2025
LAPOINTE CHRISTIAN
9-2242
LAPORTE MARCEL
9- 712
LAPORTE OTTO
9-1551
LAPP RALPH EUGENE
9-2892
LAPPLE C E
9-3091
LAPSLEY A C
9-1942 9-3926
LAREYMONDIE MARC DE
LACOSTE
9-2388
LARKIN S
9-3620
LA ROCHE GILLES
9- 828
LARSEN E I
9-1267
LARSEN ROBERT P
9- 127
LARSEN W L
9-3146
LARSH A E
9-3664
LARSON Q V
9-3099 9-3101
LARSSON KARL ERIK
9-3985
LASALLE MARY JOAN
9- 60
LASER H
9- 24
LASHER G J
9-3446
LASHKAREV V E
9-3761
LASHOF T W
9-3223
LASKIN SIDNEY
9-1731

LASSETTRE E N
9-3696 9-3994
LASTOVICA JOHN E
9-2208
LASZLO DANIEL
9- 911 9-3031
LATIMER WENDELL M
9- 657 9-2142
LATTER RICHARD
9-2989 9-3211
LATZ R N
9-4230
LAUFFER MAX A
9-2106
LAUGHLIN JOHN S
9- 706 9-1724 9-2879
LAURITSEN C C
9-1349
LAURITSEN T
9-3628
LAVELLE EUGENE B
9- 211
LAVIGNE M J
9-2252
LAVIK PAUL S
9-3376
LAVROVSKAYA G K
9-2645 9-3760
LAWHORN ROBERT N
9-4115
LAWRENCE PHILIP S
9-3025
LAYER E H
9-2345
LAZARUS D
9- 197
LEA R M
9-2940
LEACH J S LL
9- 199 9-2764
LEACH S J
9-3695
LEACHMAN R B
9-1365
LEAMER R D
9-1678
LE BAIL H
9-1214
LE BERQUIER FRANCOISE
9-2081
LEBLANC J M
9-1673 9-1675 9-2972
9-4322
LEBLOND C P
9- 828
LEBOEUF M B
9-2950
LECLAIR T G
9- 756
LE CLAIRE A D
9- 204 9-1537
LECLERC RENE
9-2140
LE CROISSETTE D H
9- 309
LEDDICOTTE G W
9-1224
LEDERER MICHEL
9-1190 9-2684 9-3108
LEDERMAN L M
9-1603 9-4253
LEE E B
9-2507
LEE J E JR
9-3411
LEE JOHN F
9-4041
LEE R E
9-2776
LEE-WHITING G E
9-2508 9-4000
LEEKEMA C H W
9-3019
LEES C S
9-2396
LEES LESTER
9-3809
LEFKER R
9-1028
LEFORT HENRY G
9-2249
LEFORT MARC
9- 580 9-1214 9-1215
9-1216
LEGER EDOUARD G
9-2407
LEGGE D I
9- 133
LEGRAND J P
9-2863 9-2864
LEHIGH UNIV
9- 52
LEHMAN J STAUFFER
9-1323
LEHMANN PIERRE
9-2898
LEIBENZON L S
9-1015
LEIBFRIED G
9- 237
LEIFER LESLIE
9-3795
LEIPUNER L
9- 671 9-1909
LEISS J E
9-4258
LEITCH L C
9-3085
LEIVO W
9- 800
LELEVIER R
9-3446
LEMBERG I KH
9-3343
LEMMER H R
9- 747 9-1406
LEMMON RICHARD
MILLINGTON
9- 102 9-2198
LEMONS JOE FRED
9-1740
LENEL F V
9-1678 9-2716 9-4163
9-4164 9-4165
LENIHAN J M A
9-4036
LENNING G A
9-1857
LENOUVEL M F
9-1617
LEONARD B P
9-2030
LEONARD GUY WILLIAM JR
9- 88
LEONG G F
9-2591
LEONTEV N I
9-3916
LEONTIC B
9-1006
LEOPOLD I H
9- 49
LEPORE JOSEPH V
9-3314
LEPOUTRE GERARD
9-1911
LERCH PIERRE
9-4015
LERMOND C A
9-3395
LERNER M W
9-3070
LE ROUX ALBERT
9-1747
LEROY GEORGE V
9-2535
LESHER E J
9-2688
LETAW H JR
9-1278
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LUBRICATION LAB MASS INST OF TECH
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MESSER CHARLES E
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METAL TRIMS INC
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METALLURGICAL ADVISORY COMMITTEE ON TITANIUM
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METALLURGICAL LABS DOW CHEMICAL CO
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MINNESOTA UNIV
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NABLO S V
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NATIONAL BUREAU OF STANDARDS
9- 77 9- 354 9- 698
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9-3117 9-3892
NATIONAL INST OF ARTHRITIS AND METABOLIC DISEASES
NATIONAL INSTITUTES OF HEALTH
9-1720
NATIONAL LEAD CO OF OHIO
9-1283
NATIONAL RESEARCH COUNCIL OF CANADA DIV OF ATOMIC ENERGY
9-2473
NATIONAL RESEARCH COUNCIL DIV OF MEDICAL SCIENCES
9-3722 9-3723 9-3724
9-3725
NATURAL RESOURCES RESEARCH INST UNIV OF WYO
9- 945
NAUGLE J E
9-1335
NAUMANN R A
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NAURITS L N
9-2233
NAVAL ENGINEERING EXPERIMENT STATION ANNAPOLIS
9- 941 9-1264 9-2280
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9-3459 9-3507 9-3824
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NAVAL MATERIAL LAB NEW YORK NAVAL SHIPYARD
9-2850
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9- 15 9- 274 9- 477
9-1720 9-1779 9-3008
9-3363
NAVAL ORDNANCE LAB
9- 303 9-1318 9-3126
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9-3510 9-3511
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9-3938 9-4051
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NEVIS CYCLOTRON LABS COLUMBIA UNIV
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NEVODNICKII N N
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NEW BRUNSWICK LAB AEC
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NEW HAMPSHIRE UNIV
9-2679
NEW YORK OPERATIONS OFFICE AEC
9-2855
NEW YORK UNIV
9-4186
NEW YORK UNIV COLL OF ENGINEERING
9-2849 9-4187
NEWBERY S P
9-2868
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NEWCOMBE H B
9- 29
NEWKIRK TERRY F
9- 616

NEWMAN E L
9- 468
NEWMAN MORRIS
9-2236
NEWMAN R C
9- 690
NEWPORT NEWS SHIPBUILDING AND DRY DOCK CO
9- 966
NEWTH J A
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NEWTON AMOS S
9-2195
NEWTON K A
9- 46
NEWTON ROGER G
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NEY E P
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NICHOLAS J F
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NORMAN AMOS
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NORMAN BRIDGE LAB OF PHYSICS CALIF INST OF TECH
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NORRIS N
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NORTH A A
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NORTHWESTERN UNIV
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NOSKOV B M
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NUCLEAR DEVELOPMENT ASSOCIATES INC
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NUCLEAR PHYSICS LABS COLUMBIA UNIV
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NUKIYAMA SHIRO
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NUSSBAUM R H
9-4018
NUTTING LEIGHTON A
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9-2454
NYGARD JOHN C
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NYSTROM ROBERT F
9- 871

OAK RIDGE NATIONAL LAB
9- 129 9- 288 9- 371
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OAK RIDGE NATIONAL LAB Y-12 AREA
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OFARRELL M P
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OFFICE OF BASIC INSTRUMENTATION NATIONAL BUREAU OF STANDARDS
9- 273
OFFICER V C
9- 679 9-1301
OFFTERMATT WILBUR F
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OFNER GERHARD
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OGAWA KAZUHIKO
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OHMART CORP
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OKLAHOMA UNIV
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OKUBO DAIZO
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OKUBO SUSUMU
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ONTARIO RESEARCH FOUNDATION CANADA
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PRINCETON UNIV
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PULSFORD E W
9-4085
PULSIFER H C
9-2717
PULSIFER VERNE
9- 978
PUNTENNEY IRVING
9- 494
PURCELL E M
9-1639 9-2011
PURCELL J
9-4168
PURDUE RESEARCH FOUNDATION
9-3810
PURDUE UNIV
9- 512 9- 949 9-3420
9-3622
PURDUE UNIV SCHOOL OF CHEMICAL AND METALLURGICAL ENGINEERING
9-3420
PURDY WILLIAM C
9-2637
PURL O T
9-2786
PUSTOVALOV G E
9-2684
PYLE ROBERT V
9-2452

QUAASS S T
9-2326
QUALLS ELSIE
9-2140 9-2744
QUARTERMAN L A
9- 527
QUARTERMASTER FOOD AND CONTAINER INST OF CHICAGO
9-2549
QUEQUIN JULES
9-2913
QUERCIA I F
9- 258
QUERIDO A
9-3019
QUERZOLI R
9-3565
QUESNEY JOSIANE
9-1788
QUINLAN KENNETH P
9-2635
QUINN EDITH
9-3054

RABBITT J C
9- 162
RABI I I
9-2903
RABIDEAU SHERMAN W
9-1740
RABIN HERBERT
9-1553 9-1554 9-3261
RABINOVITCH B S
9-1772
RABINOWICZ E
9- 961 9-3487
RABKIN ESTHER
9- 886 9- 915 9-1930
RABOY S
9-3278 9-4321
RACETTE G W
9-1299
RADER L F
9-3471
RADHAKRISHNA P
9- 593
RADIATION LAB UNIV OF CALIF BERKELEY
9- 48 9- 59 9- 60
9- 61 9- 102 9- 107
9- 117 9- 123 9- 304
9- 305 9- 306 9- 377
9- 378 9- 395 9- 402
9- 449 9- 506 9- 657
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9- 773 9- 778 9-1446
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9-4212 9-4245
RADIATION LAB UNIV OF CALIF LIVERMORE
9-2634 9-3055 9-3446
9-3936 9-4025 9-4246
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RADIATION RESEARCH CORP
9-2825
RADIOBIOLOGICAL LAB UNIV OF TEXAS
9- 478 9- 479 9-2109
RADIOLOGICAL LAB UNIV OF CALIF SAN FRANCISCO SCHOOL OF MEDICINE
9-1723
RADIOLOGICAL RESEARCH LAB COLUMBIA UNIV
9- 820
RADIOPHYSICS LAB UNIV GROUNDS SYDNEY AUSTRALIA
9-2409 9-2410
RAESFELD A
9-2230
RAEZER SPENCER D
9-1502
RAGOSINE VICTOR E
9-3901
RAHM DAVID C
9-2425
RAHMAN A
9- 344
RAHMEL A
9-2617
RAIBLE R W
9-1379
RAIEVSKI VICTOR
9-2476
RAINWATER JAMES R
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RAISIC NENAD
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RAIT J R
9-2317
RAJSIC NENAD
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RAKIC MIODRAG D
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RALEY CHARLES F JR
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RALL J E
9-1179
RALPH ELIZABETH K
9-2347
RAMAKRISHNAN ALLADI
9- 323
RAMANIAH M VENKETA
9- 131
RAMIREZ ERNEST R
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RAMSEY N F
9-1341 9-1392
RAND CORP
9- 1 9-1863 9-2590
9-2989 9-2990 9-3211
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RANKIN A W
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9-1688
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RANZ W E
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RAO BH S V RAGHAVA
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RAPOPORT HENRY
9- 59
RAPOPORT L P
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9-3208
RASE D E
9-3142
RASEMAN C J
9-3285
RASETTI F
9- 401 9-2973
RASMUSSEN STANLEY W
9-4301
RASMUSSEN V K
9- 769
RASOR NED S
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RATHKAMP W R
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RATNER A P
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RAU R RONALD
9-1058 9-1989
RAUCH R
9-1798
RAVENTOS ANTOLIN
9- 487
RAW MATERIALS DEVELOPMENT LAB AMERICAN CYANAMID CO ATOMIC ENERGY DIV
9-4146
RAW MATERIALS DEVELOPMENT LAB NATIONAL LEAD CO INC
9-2635 9-3779
RAYBURN L A
9- 419
RAYMOND W H A
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RAYNES BERTRAM C
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RAYNOR G V
9-2767 9-2768
RAYSKI J
9-1623
READ CHARLES B
9-2709
READ T A
9-3885
READING UNIV READING BERKS ENGLAND
9-2739
REAGAN DARYL D
9-3644 9-4292
REDING F P
9- 888
REDISKE J H
9-3752
REDLICH MARTIN G
9-4267
REDLICH O
9-3078

REDMILL P E
9-3962
REDMOND R F
9-1492
REDMOND ROBERT L
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REDSTONE ARSENAL
HUNTSVILLE ALA
9-3362
REED GEORGE W
9- 817
REED J F
9-1772
REED JAMES M
9- 11 9- 33
REED STANLEY A
9- 92
REED T M III
9-2235
REEKIE JAMES
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REES JOHN R
9- 769 9-2937
REGENSTREIF E
9- 388 9- 393 9-3661
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REGNIER GEORGE
9-4052
REICHARD THOMAS E
9-4120
REID J M
9-2964
REID JOHN M
9-2541
REIF ARNOLD E
9-3359 9-3360
REIFFEL L
9-1977 9-2945 9-3333
REIN J E
9- 533
REINES F
9- 994 9 1352
REINHARDT P W
9- 281 9-1321
REINING H J
9-1441
REISS S
9-4134
REIST HELEN N
9- 59
REITZ R A
9-2469
REM-CRU TITANIUM INC
9- 184 9-2296
REMOLD F
9-1162
RENNER H
9-2148
RENNERT JOSEPH
9- 865
RENSSELAER POLYTECHNIC
INST
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9-3871
RENSHAW W G
9-1542
REPOSSI RENATO
9-2673
RERAT CLAUDE
9-1011
RESEARCH AND DEVELOPMENT
BRANCH INDUSTRIAL
GROUP CAPENHURST WORKS
UNITED KINGDOM ATOMIC
ENERGY AUTHORITY
CAPENHURST CHES
ENGLAND
9-3385 9-3570 9-3583
9-3584
RESEARCH AND DEVELOPMENT
BRANCH INDUSTRIAL
GROUP HEADQUARTERS
UNITED KINGDOM ATOMIC
ENERGY AUTHORITY
RISLEY LANCS ENGLAND
9-2822
RESEARCH AND DEVELOPMENT
BRANCH INDUSTRIAL
GROUP WINDSCALE WORKS
UNITED KINGDOM ATOMIC
ENERGY AUTHORITY
WINDSCALE CUMB ENGLAND
9-3514 9-3515 9-3746
9-3760 9-3815 9-3790
9-3864 9-3934 9-4231
RESEARCH FOUNDATION
OHIO STATE UNIV
9-2026 9-3146 9-3407
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RESEARCH INST
TEMPLE UNIV
9-..57 9-3394 9-3498
RESEARCH LAB ALLEGHENY
LUDLUM STEEL CORP
9-2720
RESEARCH LAB OF
ELECTRONICS MASS INST
OF TECH
9- 652 9-1304 9-4210
RESEARCH LABS DIV
GENERAL MOTORS CORP
9-4123
RESEARCH LABS LOVELACE
FOUNDATION FOR MEDICAL
EDUCATION AND RESEARCH
ALBUQUERQUE
9- 877
RESEGOTTI L
9- 391 9- 770
REVINSON D
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REYNOLDS E E
9-2273 9-2720 9-3488
REYNOLDS GEORGE T
9-1058 9-1988 9-1989
REYNOLDS H L
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REYNOLDS J H
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REYNOLDS M B
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REYNOLDS MARDELLE L
9-3366
REYNOLDS P
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REYNOLDS SAM A
9- 87 9-3109
RHINEHART W A
9-3242
RHODEN V C
9- 702
RIBNIKAR SLOBODAN V
9- 861
RICCI JOHN E
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RICCI RENATO
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RICE M H
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9-2373
RICH MARVIN
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RICHARDS C B
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RICHARDS R S
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RICHARDS T LL
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RICHARDSON E K
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RICHARDSON JASPER E
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RICHARDSON R J
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RICHEY EVERETT O
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RICHMOND JOHN L
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RICHMOND JOSEPH C
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RICHTER ALAN
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RICHTER B
9-1670
RICHTER D E
9-2629
RICHTER H G
9-3653 9-3654
RICKARD JAMES A
9-1349
RIDENOUR LOUIS N
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RIED LOUIS JR
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RIEMAN WILLIAM P
9-1964
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RIEPPEL P J
9-1532 9-3494
RIESE GRETCHEN
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RIGG T
9- 108
RIGHTMIRE ROBERT A
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RILEY JOHN F
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RILEY RICHARD F
9-1468 9-2115
RINEHART M
9-4253
RINGBOM ANDERS
9-4078
RIOU MICHEL
9-4275
RIPARBELLI CARLO
9- 177
RIPLING E J
9-1848
RISPOLI B
9- 258
RISSER J R
9-1975
RITTER H L
9-3409
RITUS V I
9-2883
ROACH JOHN FAUNCE
9-1171
ROBBINS C H
9- 2
ROBBINS SHIRLEY
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ROBERT J
9-2962
ROBERTS A S
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9-1518 9-1519
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9-2765
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9-1465
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ROBINSON HERBERT A
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ROBINSON LAWRENCE BAYLOR
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ROBINSON LESLY G
9- 25
ROBINSON P L
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ROBINSON W H
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ROCCO GREGORY
9-1700
ROCHE M T
9-4117
ROCHESTER UNIV
9- 394 9-1140 9-1653
9-1946
ROCK ISLAND ARSENAL LAB
9- 147 9-3115
ROCKET LAB PURDUE UNIV
9-3810
RODERICK H
9-2057
RODGERS SHERIDAN J
9- 948 9-1254 9-1903
9-1904
RODIONOVA L M
9-1933 9-2368
ROE GLENN M
9- 369 9-1655
ROEHRICH-GOUSSU O
9- 713
ROENSCH ARNO P
9- 649
ROESCH W C
9- 400
ROGER FREDERIC
9-3692
ROGERS B A
9-3170
ROGERS BETTY S
9-1976 9-3773
ROGERS CHARLES M
9-2109

ROGERS K C
9-4253
ROGERS K J
9-1256
ROGERS L B
9-1205 9-3395 9-3396
ROGERS LEWIS H
9- 898
ROGERS MAX T
9- 546 9- 547
ROGERS N E
9-2671
ROGERS P S
9-3962
ROGINSKII S Z
9- 85 9-3767
ROGOZINSKI ANATOLE
9- 717 9-2867
ROHRIG H
9-4169
ROHRMAN F A
9- 289
ROLFE J A
9-1137
ROLL KEMPTON H
9-2253
ROLLEFSON G K
9-3792
ROLLET ANTOINE-PIERRE
9-4073 9-4089
ROLLIER MARIO ALBERTO
9-2673 9-4016
ROLLOR E A
9-3252
ROME MARTIN
9- 71
ROOS K
9-1893
ROOTHAAN C C J
9-4239
ROSE ARNOLD S
9-1886
ROSE ARTHUR
9-3249
ROSE B
9-3320
ROSE H
9- 753 9-1083
ROSE H W
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ROSE HORACE EDGAR
9-1291
ROSE J E
9-1980
ROSE M E
9- 855 9-2991 9-3330
ROSE M V
9-4163 9-4164 9-4165
ROSEMOUNT AERONAUTICAL
LABS UNIV OF MINN
9-3578
ROSEN FRED D
9-3862
ROSENBAUM D M
9- 976 9-2722
ROSENBAUM JACK D
9-2535
ROSENBERG A J
9- 968
ROSENBLUM B
9-2097
ROSENBLUM SALOMON
9- 381 9-1410
ROSENBLUTH ARIANNA W
9-2889
ROSENBLUTH MARSHALL N
9- 619 9-2889
ROSENFELD GEORGE
9-1165 9-1166
ROSENTAL I L
9-4027
ROSENZWEIG WALTER
9-3256
ROSI F D
9-3872 9-3873
ROSIN SEYMOUR
9- 284
ROSS J D
9-2194
ROSS J F
9-2870
ROSS M A S
9-2975
ROSS MALCOLM
9-3630
ROSS STEVEN W
9-1991 9-3938
ROSSI A
9-3632
ROSSI H H
9-3951
ROSSI HARALD H
9-3256 9-3311
ROSSLER FRITZ
9-3571
ROSTOKER WILLIAM
9- 180 9- 975 9-1539
9-1874 9-2293 9-2721
9-2728 9-3166 9-3489
9-3516 9-3517 9-3524
9-3851 9-3853
ROTBLAT J
9- 410 9- 795 9-1152
9-1369 9-1390
ROTH FRANKLIN E
9-1721
ROTH R S
9-3820
ROTH ROBERT J
9- 191 9-3181 9-3182
ROTHE W
9-2205
ROTHFUS R R
9-3131
ROTHMAN STEPHEN J
9- 179 9-3874
ROTHSCHILD WALTER G
9-2847 9-2848
ROTT N
9-1014
ROUBAULT MARCEL
9-2711
ROUNDS DONALD E
9- 846
ROUNDS WAYNE M
9-3750
ROURKE F M
9-2401
ROUT R J
9-3955 9-3956
ROUZE S R
9- 689
ROWE J J
9-2638
ROWEN JOHN W
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ROWLAND F S
9-2922
ROWLAND J A JR
9-2760
ROWLAND R E
9-1980 9-3591
ROWLAND T J
9-2695 9-3189 9-3972
ROY R R
9- 315 9- 316 9-2913
ROY RUSTUM
9-3142
ROYAL AIRCRAFT
ESTABLISHMENT
FARNSBOROUGH HANTS
ENGLAND
9-1808
ROYDEN VIRGINIA
9- 361
ROYLANCE J
9-2189
ROYS P A
9-1656
ROYSTON R J
9-3997 9-4265
ROZENFELD A M
9- 275
ROZENTAL I L
9- 333 9-2366 9-2367
RUBIN BERNARD
9- 853
RUBIN L R
9-2764
RUBIN MEYER
9-3472
RUBINOW S I
9-4336
RUBINSON WILLIAM
9-1679
RUBY S L
9-3337
RUDD D P
9- 662 9-2130
RUDDY JOHN M
9-2656
RUDMAN P S
9- 972 9-2294
RUDSTAM S G
9-2676 9-3982
RUEHLE WILLIAM JR
9- 371
RUEHRWEIN ROBERT A
9-2626
RUGGIERO ASSUNTA
9-2982
RUGGIERO G
9-2127
RUGH ROBERTS
9- 820 9-3741
RUMER YU B
9-4028
RUMSEY V H
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RUNNER MERVIN E
9-1741
RUPPENDER ROBERT R
9- 645
RUSANOV A K
9-4084
RUSS CLEM
9-3041
RUSSELL C
9-2199
RUSSELL LIANE B
9- 825
RUSSELL W L
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RUST JOHN H
9-2572
RUSTAD B M
9-3337
RUTH JOHN M
9-1823 9-1824 9-3823
RUTHERFORD JOHN L
9-1855
RUTLEDGE GENE P
9- 898
RUTTEWITT KURT
9-3184
RYABININ A G
9-2698
RYAN R D
9-2409 9-2410 9-1838
9-1847 9-3843
RYERSON F E
9-3380
RYLANDER E W
9- 578
RYSCHKEWITSCH E
9-4093
RYSKIEWICZ E E
9-3382 9-3758
RYZHANOV S G
9- 457

SABLE V H
9-3434
SABROFF A M
9-2276
SACCONI L
9- 135
SACHER GEORGE A
9-2567
SACHS FRANCES L
9-1961
SACHS GEORGE
9-2297
SACHS R G
9- 426 9- 732
SADAUSKIS JOHN
9-3499
SAELAND EINAR
9- 899 9-3030 9-4016
SAHA A K
9-1636
SAHA N K
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SAILOR V L
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SAITO NOBUFUSA
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SAKAI KAORU
9-2139
SALAM ABDUS
9-3273
SALAMONE JEROME J
9-2236
SALANT E O
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SALARIA G B S
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SALDICK JEROME
9-2041 9-3061
SALIKHOV S G
9-2075
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9-1654
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9-1820
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9- 366 9-2388 9-3587
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SALMON O N
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SALPETER E E
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SALTER J
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SALUTSKY MURRELL L
9-1757 9-2399 9-3793
SALVAGGI J
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SAMA L
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SAMARINA V A
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SAMMAN ADHAM
9-2444
SAMOILOV O YA
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SAMPSON M B
9- 769

SAMSAHL KNUT
9-3796 9-4235
SAMSONOV G V
9-1821
SAMUEL ALAN J
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SAMUEL P
9-2317
SAMUEL FELTMAN AMMUNITION LABS PICATINNY ARSENAL
9-3178
SAMUELSON OLOF
9-1200
SANCIER KENNETH M
9- 873
SANDBORN VIRGIL A
9-2693 9-2694
SANDEL ANNE
9-1765 9-2680 9-3447
SANDERS PHYLLIS C
9-1711 9-1976
SANDERSON R T
9-2185
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SANDS RICHARD D
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SANDSTEDT R
9-2679
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SANGREN WARD C
9-2845
SANO MITSUO
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SANTISTEBAN GEORGE A
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SANTISTEBAN M
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SAPERSTEIN A M
9- 787 9- 788
SAPHIR GEORGE
9-2929
SARABHAI V
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SARAZIN A
9- 391 9- 770
SARGENT C P
9-4253
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SARKES L A
9-2870
SARMA B
9-3431
SARMA R N SEN
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SARTORIUS ROBERT
9-1747
SARUKHANIAN G
9-1811
SASAKAWA TATUYA
9-2001
SASLAW I M
9-1798
SASMOR D J
9-3221
SASS L
9-1865
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9-2932
SATCHLER G R
9-3707
SATO IWAO
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9-4106
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SATTERFIELD C N
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SATTIZAHN J E
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SAUNDERS J M
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SAUTER CHARLES
9-1817
SAVAGE H WESLEY
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SAVAGE W F
9-4197
SAVEL M P
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SAVEL PIERRE
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SAVIC PAVLE
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SAWADA KATURO
9- 403
SAWADA SHOZO
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SAX KARL
9-3027
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SAYRE EDWARD V
9-1416 9-1417
SCARGILL P
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SCARSI L
9-3957
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SCHACHNER H
9-1010
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9-3362 9-3726
SCHAEFFER O A
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SCHALLENBERG ELMER E
9- 123
SCHAMPERS P P M
9-1328
SCHARFF-GOLDHABER GERTRUDE
9-4270
SCHARFF M
9-1019
SCHECHTMANN J L
9-3731
SCHECTER LARRY
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9-1664 9-1929 9-4221
SCHERAGA H A
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SCHERRER M
9-2862
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SCHMID P
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SCHMIDT F H
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9-1436
SCHMOUKER J
9-3674
SCHNEIDER B AUBREY
9-2535
SCHNEIDER W G
9-3573 9-4189
SCHNEPS J
9-1985 9-3236
SCHOENBORN HENRY W
9-1716
SCHOFIELD H Z
9-1820
SCHONBERG NILS
9- 857 9- 858 9- 887
9-3185
SCHONLAND B F J
9-3474
SCHONLAND D S
9-2442
SCHOOL OF AVIATION MEDICINE
9- 4 9- 13 9- 14
9- 16 9- 478 9- 479
9- 877 9-2109 9-2110
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SCHOOLAR JOSEPH C
9-2572
SCHOPPER E
9-1940 9-2477
SCHORK P K
9-3363
SCHRADER GEORGE F
9-1456
SCHRANK GLEN
9-1114 9-2924
SCHRAUZER GERHARD NORBERT
9-2141
SCHREIER KURT
9- 486
SCHREINER G D L
9-3474
SCHRENK H H
9- 845
SCHREYER J M
9- 129
SCHROCK VIRGIL E
9-4061
SCHRODER MARY E
9-4063
SCHUBERT G
9-3017
SCHUBERT JACK
9- 68
SCHULER ROBERT H
9-1782 9-2200
SCHULMAN J H
9-3116
SCHULTE H F
9-2723
SCHULTEN R
9-2015
SCHUMACHER B
9-1940 9-2475 9-2477
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9-3098
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SCHUSSLER M
9-3149
SCHWARTZ ANTHONY M
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SCHWARTZ CHARLES
9-2523
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SCHWEISTHAL ROBERT
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SCHWEITZER WILLIAM
9-1711
SCHWERDTFEGER W J
9-3152
SCHWOPE A D
9-1820 9-3863
SCOTT ALLEN B
9- 672 9-1784
SCOTT B P
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9-1775
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9-1070
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9-1731
SCOTT JOHN
9-1817
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9- 95
SCOTTI A
9-3632
SCOW ROBERT O
9-2543
SCROCCO EOLO
9-2887
SCRUGGS WILLIAM C
9-2546
SEABORG G T
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SEAGRAVE JOHN D
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SEAMAN ARTHUR J
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SECOY C H
9-3384
SECREST E LEIGH
9-2028
SEDLET J
9-4074
SEEBOLD R E
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SEED J
9-3659

SEED LINDON
9- 45
SEELMANNEGGEBERT W
9- 448
SEGE G
9- 568
SEGRE E
9- 769 9-1341
SEIBEL RICHARD D
9-1535
SEIDEN JOSEPH
9- 398 9- 399
SEIDL F G P
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SEIDLIN S M
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SEIGLE L L
9-3872 9-3873
SEITH WOLFGANG
9-3526 9-4191 9-4214
SEKIKAWA KYOZO
9-1290
SELDERS A A
9-3752
SELEKTOR YA M
9-2935
SELIGMAN HENRY
9- 612
SELIVERSTOVA L A
9-1170
SELKE W A
9-3104
SELLERS DOUGLAS E
9- 88
SELLERS PHILIP A
9- 904
SELLMAN P G
9-1192
SELOVE W
9-4307
SENDEROFF SEYMOUR
9-2147 9-2221 9-2222
9-2223
SENFTLE F E
9-2514 9-3464
SENIO P
9- 428
SENIOR B
9-4059
SENITZKY B
9-2903
SENN O F
9- 854
SENNETT F E
9-3820
SENSE KARL A
9- 548
SEPMEYER L W
9- 1
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9-1372 9-1373
SEREN LEO
9-3990
SERRANO E SANCHEZ
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SERVOMECHANISMS LAB
MASS INST OF TECH
9-3207 9-3588 9-3589
SESSLER A M
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SETLOW RICHARD
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SETTI R LEVI
9- 260
SEYFANG A P
9-2687
SEYMOUR R C
9-2834
SEYMOUR W E
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SHAFIR A I
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SHAH G Z
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SHAKELY B L
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SHALNEV K K
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9-3128 9-3147 9-3148
9-3217
SHAMOS M H
9-1003
SHAMOVSKII L M
9-2368
SHAPIRO G
9-2879
SHAPIRO I S
9- 334 9-1420
SHARMA OM PRAKASH
9-2522
SHARMAH L J
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SHARP BYRON J
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SHARP W H
9-3837
SHARP W T
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SHATENSHTEIN A I
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SHAW C H
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SHAW K G
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SHAW P F D
9- 792
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SHAWE D R
9-3837
SHCHUKAREV S A
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SHECHMEISTER I L
9-2577 9-2578
SHEEHAN E A
9-3288
SHEINA Z G
9-1193
SHEINHARTZ I
9-2244
SHELDON J
9-3776
SHELL DEVELOPMENT CO
9-2790 9-2791
SHELLABARGER C J
9-1709
SHELTON R D
9-1375
SHEPARD A P
9-3150
SHEPARD LAWRENCE A
9-3521
SHEPARD O CUTLER
9-2718
SHEPHARD W D
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9- 753 9-1083 9-3258
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9-3032
SHERBY OLEG D
9-2732 9-2733
SHERIDAN DOUGLAS M
9-3836
SHERIDAN J
9-3347
SHERLOCK R H
9-2688
SHERMAN NOAH
9-2474
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9-2749
SHERR R
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SHERRILL F A
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SHERWOOD ALEXANDER M
9-3829 9-3838
SHERWOOD D W
9-1426
SHERWOOD E M
9- 976 9-2722
SHERWOOD J E
9-1658
SHEVALEEVSKII I D
9-3073
SHIBATA H
9-1293
SHIBATA KAZUO
9-3357
SHILLIBEER H A
9- 625
SHIMAUCHI AKIRA
9-1303
SHIMAZAKI T T
9- 2
SHINDO MITSUO
9-1666
SHINYAEV A YA
9-3874
SHIPMAN J D
9-1039
SHIRANE GEN
9-3238
SHIRK HAROLD G
9- 125
SHIRN G A
9-3188
SHIROKOV V I
9-1884
SHIROKOV YU M
9-2534
SHISHAKOV N A
9- 886
SHMUSHKEVICH I
9-1376
SHOCH DAVID
9- 494
SHOEMAKER WILLIAM C
9-1732
SHOMATE C HOWARD
9-2152
SHOOLERY JAMES N
9-3636
SHOR M
9- 947
SHOR ROBERTA S
9- 127
SHORE BERNARD W
9-2540 9-3071 9-3776
SHORT N M
9-1826 9-3461
SHOSTAKOVICH N V
9-2365
SHPINEL V S
9- 743
SHREFFLER R G
9- 265
SHRIKANTIA G S
9-1059
SHRUBSALL ARTHUR E
9- 218
SHTAUBERG I F
9-3073
SHTEINBOK N I
9-1334 9-1968
SHULL C G
9-2312 9-3218
SHULL HARRISON
9-1036
SHULL T T
9- 875
SHUMWAY B W
9-3938
SHURCLIFF WILLIAM A
9-3922
SHURE K
9-1656
SHUTT R P
9-2940 9-4257
SHVANGIRADZE R R
9-3074
SIBBITT WILMER L
9-2338
SIBERT MERLE E
9-3477 9-4183
SIDA D W
9-3556
SIDORENKO G A
9-1933
SIDOROV V M
9-3605
SIEBEL ERICH
9-4193
SIEBERT CLARENCE A
9-4185
SIEDE A
9- 978
SIEGEL EDWARD
9-1173
SIEGEL R
9-3286
SIEGEL S
9-2685
SIEGERT A
9-1162
SIEGFRIED W
9-1890 9-3880
SIGMAN H
9- 533
SIGURGEIRSSON THORBJORN
9-2463 9-2464
SIKOV M R
9- 19
SILBERBERG MARTIN
9- 485
SILBERBERG RUTH
9- 485
SILBERG P A
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SILBERSTEIN HANNAH E
9-2610
SILIN V P
9-2034 9-2083
SILLEN LARS GUNNAR
9-1469 9-2620 9-2621
SILSBEE H B
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SILVER E G
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9- 621 9-1826 9-3481
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9-3097
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9-2163
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SILVERMAN RONALD
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SILVERMAN S
9-3696 9-3994
SIMANTON JAMES R
9-1681

SIMCOE C R
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SIMMLER JOSEPH R
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SIMMONS B E
9-2073
SIMMONS O W
9-3847
SIMMONS WALLACE R
9-2691
SIMON SIDNEY L
9- 951
SIMON WILBUR
9- 903
SIMONS E M
9-1503
SIMONS H A B
9-2397
SIMONS J H
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SIMONSON CAROL
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SIMPSON J A
9-1002
SIMPSON J AROL
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SIMS C T
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SINCLAIR D A
9- 66 9- 308 9- 674
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SINGER IRVING A
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SINGER S J
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SINGH K
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SINGLETON W RALPH
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SINHA S K
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SINNOTT MAURICE J
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SIRKAR G N
9-1932
SIRKIS M D
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SITENKO A G
9-2043
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9-1565 9-1925 9-1926
SITTNER G H
9- 606
SIZELAND M L
9-3427
SIZOO G J
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SJOSTRAND N G
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SJOSTROM EERO
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SKAGGS LESTER S
9-2025
SKEATS N B
9-1080
SKINNER GORDON B
9-2626
SKINNER H W B
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SKRZEC ADAM E
9-2208
SKYRME T H R
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SLADEK RONALD J
9-3202
SLATER M
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SLATIS HILDING
9-3331 9-3669
SLATTERY R E
9- 439
SLIFKIN L
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SLIV L A
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SLOAN L G
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SLOTH ERIC N
9-1749 9-3770
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9-4272
SMAKULA A
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SMALL V G
9- 694 9-3284
SMALLER BERNARD
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SMARS E A
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SMIRNOV M V
9-1883
SMIT W M
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SMITH RAYMOND L
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9-2047
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9-3144
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9-2280
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SMITH WM T JR
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SMOLKIN G E
9-2860 9-4248
SMOLUCHOWSKI R
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SMORODINSKII YA A
9- 416 9- 741
SMUTZ M
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SMYTH CHARLES P
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SNELL ARTHUR H
9-2078
SNELLING G F
9-3947
SNIDER JOHN L
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SNOW G
9-3318
SNYDER ALBERT WILLIAM
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SNYDER JAMES N
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SNYDER M J
9- 548
SNYDER T
9-3712 9-3713
SNYDER W S
9-4014
SOBERMAN R K
9-3564
SOBOL S I
9-2616
SODHA MAHENDRA SINGH
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SOFTKY SHELDON DORMAN
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SOHNGEN R
9-3421
SOISTER PAUL E
9- 627
SOKILOWSKI E
9-3689
SOKOLOFF BORIS
9-3043
SOKOLOV A A
9-2000
SOLDANO B
9-3099 9-3100 9-3101
SOLHEIM A
9-1005
SOLID-STATE AND MOLECULAR THEORY GROUP MASS INST OF TECH
9- 231
SOLIMENE N
9-1771
SOLMITZ F
9-2039
SOLMS J
9- 118
SOLOMON A K
9-1465 9-1735 9-1736
SOLOMON A L
9-1580 9-1893 9-3251
SOLOMON HERBERT
9-3209
SOLON LEONARD R
9-3953
SOLOVEV V G
9- 332
SOLOVKIN A S
9- 70
SOMERVILLE ALEXANDER
9-4123
SOMMER A H
9-1580 9-1893 9-3251
SONDER E
9-1278
SONODA MASATERU
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SOOLE B W
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SOPHER R P
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SOPP THEODORE E
9-1323
SORENSEN S O
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SOULEN JOHN R
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SOUTHERN RESEARCH INST
9-2354 9-2355 9-2356
9-2357 9-3775 9-4215
SOUTHWEST RESEARCH INST
9- 517 9-4108
SOWARDS DONALD M
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SOWMAN H G
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SPACIL H S
9-1527
SPACKMAN W JR
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SPAIN PATRICIA C
9- 846
SPALDING FLORENCE F
9-2847 9-2848
SPARKS CULLIE J JR
9-1836
SPARROW A H
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SPECK D R
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SPEDDING F H
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SPEIRS JOHN L
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SPEISER DAVID
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SPEISER R
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SPELLMAN MITCHELL W
9-1721
SPENCER HARRY E
9-3792
SPENCER HERTA
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SPENCER L V
9-2045
SPERDUTO A
9-1393

SPICE J E
9-3393
SPIEGLER G
9-3374
SPIERS F W
9- 444 9-2125
SPILLETT E E
9-2774
SPINK D R
9- 586
SPINKS J W T
9-2201
SPIRTES M A
9-3740
SPITSBERGEN U
9-2156
SPIVAK G V
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SPOERL EDWARD
9-1461
SPORER ALFRED H
9- 873
SPRAGG W T
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SPRAKER W A
9-1799 9-1800 9-1801
9-1802
SPRARAGEN W
9- 222
SPRATT EUGENE C
9-1704
SPRETNAK J W
9-3146
SPURWAY A H
9- 694 9-3284
SQUIRES G L
9-2439
SRIVASTAVA R C
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STAATZ MORTIMER H
9-1516 9-4156
STACY J T
9-1854
STADLER HENRY L
9- 424
STAHL R H
9-1392
STALLARD FRANK W
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STALLWOOD R A
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STAM PAUL B
9- 922
STAMBAUGH C K
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STAMM H
9-1162
STANDARD OIL CO OF IND
9-1814
STANDIL S
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STANFORD C P
9-1065 9-1391
STANFORD RESEARCH INST
9- 518 9- 854 9-2792
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STANFORD UNIV
9-2992 9-3051
STANFORD UNIV SCHOOL OF
MINERAL SCIENCES
9- 179 9-2718
STANG L G JR
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STANLEY C W
9- 876
STANNARD J NEWELL
9-1164 9-1705 9-4055
STANSBURY E E
9- 185
STANTON J S
9-2872
STAPLETON GEORGE E
9-3743
STARBIRD A W
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STARFELT N
9-2505 9-2969
STARITZKY E
9- 848
STARK B T
9-2950
STARNER J W
9- 438 9-3687
STARR C DEAN
9-3521
STATISTICAL RESEARCH LAB
UNIV OF ILL
9-2103
STAUB H
9-1341
STAVELEY L A K
9-3393
STEARNS M
9- 671 9-1909
STEARNS M B
9- 671 9-1909
STEDEFORD J B H
9-2806
STEELE DORIS V
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STEELE M C
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STEFFEN R M
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STEIGMAN J
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STEIN CHARLES
9-1876
STEIN P C
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STEINBERG E P
9-2174 9-3633 9-3791
STEINBERG GUNTHER
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STEINBERG MORRIS A
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STEINBERGER J
9-4254
STEINBOCK HELENE L
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STELSON P H
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STENDER H ST
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STENT GUNTHER S
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STEPHENS F M JR
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STEPHENSON J
9-3000
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STEPHENSON T E
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STERK M J
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STERLING E
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STERLING CHEMISTRY LAB
YALE UNIV
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STERMAN L S
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STERN D J
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STERNHEIMER R M
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9-4259
STERRETT K
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STERZER FRED
9-1773
STEUDEL ANDREAS
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STEVEN H M
9- 606
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STEVENSON M LYNN
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STEVENSON PETER C
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STEWARD C W
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STEWART A L
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STEWART HAROLD S
9- 284
STEWART J A
9- 248
STEWART JAMES E
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9-1753
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9-3824
STHAPITANONDA PRASOM
9-2627
STICHA E A
9-1858 9-3176
STIDHAM H D
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STIEFF L R
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STIER P M
9- 992 9-1051
STIGMARK L
9- 322
STINSON JAMES V
9- 25
STITCH M L
9- 811
STITES JOSEPH G JR
9-1757
STITT R K
9- 271
STOCKLAND K
9-3155 9-3711
STODOLOVA ALENA
9- 536
STOHLMAN FREDERICK JR
9-3739
STOKES ARTHUR J
9-3546
STOKES WILLIAM LEE
9-2262
STOKINGER H E
9-1731
STOLL P
9-1095 9-1116
STONE BOB D
9-1757
STONE L
9-4187
STONE R S
9-1306 9-1317
STONE RICHARD S
9-1582
STOPPANI A O M
9- 506
STORAASLI JOHN P
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STORER JOHN B
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STOREY ROBERT H
9-1737
STORM M L
9-3287
STOTT P
9-2421
STOUT J W
9- 92
STOUT R D
9-4195
STOVER EDWARD R
9-3457
STRAHL ERWIN O
9- 621 9-1826 9-3461
STRAIN HAROLD H
9-1220 9-1221 9-1222
9-4106
STRANDBERG M W P
9- 343
STRASHKEVICH A M
9-2379 9-2380 9-3229
STRATTON T F
9- 242
STRAUMANIS M E
9-1255 9-2146 9-3067
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STRAUSS HERBERT D
9-1732
STRAUSS ULRICH P
9-3772
STREBE FRANK C
9-1966
STREET K JR
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STRICKLAND LAWRENCE
9-4234
STRINDBERG SAMUEL J
9-3455 9-3845 9-3848
STROBEL H A
9- 872
STROHBECK D D
9-1846
STROMBURG W
9-1272
STROOT J P
9- 770
STROUD AGNES N
9-2598 9-2611

STROUP P T
9-1743
STUART R V
9- 242 9-2073
STUBRINGTON C A
9-2371
STUBRINS WARREN FENTON
9- 395 9-3662
STUDIER M H
9- 362 9-1489 9-2055
STUDOR R R
9-3476
STUHLINGER ERNST
9-3362
STUMP ROBERT
9-1026
STURM W J
9-1668
STYKA ANDRE
9-2752
STYRIKOVICH M A
9-3449
SUAREZ V
9-1062
SUBCOMMITTEE ON HEAT RESISTING MATERIALS NACA
9-4170
SUBRAMANIAM A
9-3560
SUCCI C
9- 259
SUDAK FREDERICK N
9- 489
SUDDETH J A
9-1023
SUE PIERRE
9-2179
SUESS HANS E
9-3472
SUGA K
9-1367
SUGANOMATA S
9- 384
SUIT H D
9-3011
SUJISHI SEI
9-1741
SULLIVAN EDWARD A
9-3774
SULLIVAN J C
9- 923
SULLIVAN J F
9-2749
SULLIVAN L O
9- 577 9-3877
SUMMERS MILDRED M
9-2598
SUMMERS-SMITH D
9-3354
SUMP C H
9-3538
SUMSION H T
9-4169
SUNDER JOSEPH H
9-3041
SUPPLEE HELEN
9-1447
SURGALLA M J
9- 474
SUSANO C D
9-3411
SUSIC MILENKO V
9-1149 9-1150 9-1232
SUSSKIND H
9- 565
SUTPHEN WILLIAM T
9- 860
SUTTLE JOHN F
9-4112
SUTTON E
9- 859
SUTTON GRAHAM
9-3274
SUTTON J
9-3438
SUTTON R B
9- 776 9- 790
SUZOR F
9- 442
SVANTESSON N L
9-2969
SVEC HARRY J
9-2382 9-3246
SVERDLOV L M
9- 345
SVIRBELY J L
9-2606 9-2607
SVIRBELY JOSEPH L
9- 53
SWAIN C GARDNER
9-2646
SWAKON EDWARD A
9-1814
SWAMI M S
9- 677 9-3236
SWAN P
9-1113 9-1381 9-2999
SWANK ROBERT K
9-2426 9-3942
SWANN W F G
9- 673
SWANSON C P
9-3020
SWARTZ C D
9-2854
SWARTZ CARL E
9-2303
SWARTZ J C
9-4241
SWEETMAN D R
9-4005
SWETNICK M J
9-3564
SWIATECKI W J
9-4268 9-4269 9-4311
9-4338
SWICK ELOISE S
9-3894
SWIM LEROY E
9- 88
SWINDELLS FRANK E
9-2670
SWINEHART BRUCE A
9- 512
SWOPE H GLADYS
9-1501
SWORSKI THOMAS J
9-2660 9-2669
SYKES E C
9-2328
SYKES J B
9-3361 9-3421 9-3449
9-3527 9-3552 9-4192
SYLVESTER GEORGE E
9-1731
SYRACUSE UNIV
9- 597 9-2297 9-4127
SYRETT J J
9-2445 9-3974
SZAFIR J J
9- 508

TABER KENNETH W
9-2123
TABERN D L
9-1459 9-1737
TABERSHAW IRVING R
9- 840
TAFFARA L
9-1061
TAGGART M S JR
9-3593
TAGLIAFERRI G
9- 259
TAIMNI I K
9- 82
TAKEBE HISAO
9-3699 9-3700
TAKEDA GYO
9-3681
TAKEMOTO S
9- 384
TAKIBAEV ZH S
9- 709
TALAIRACH J
9-2127
TALBOT M
9- 891
TALBOT R V
9-1039
TALBOYS ALBERT P
9-1704
TALLEY HARRY E
9-1026
TALLEY L H
9- 509 9-1708
TALLEY ROBERT M
9-1766
TALLONE L
9-1624 9-1625
TALMAGE ROY V
9- 508
TAMASCHKE CHRISTIANE
9-2545
TAMM I E
9- 329
TAMOR S
9-3316
TAMURA TARO
9-1638 9-3635
TANAKA KATSUMI
9-1112
TANAKA Y
9-1567
TANANAEV I V
9-1768
TANDLER WILLIAM E
9-3806
TAPLIN GEORGE V
9- 700 9-1462
TASMAN H A
9-2375
TATE P A
9- 343
TATLOW J C
9-2189
TATTAN MARK H
9- 302
TAUGBOL KJELL
9-3796 9-4235
TAUTFEST G W
9-3265
TAVERNIER G C
9-3291
TAYLOR A E
9-2456 9-2457 9-2458
9-2459 9-2460 9-4004
TAYLOR ALBERT E
9-2639
TAYLOR B C
9-1437
TAYLOR C
9-1314
TAYLOR DENIS
9- 295 9- 296 9-1329
9-2415
TAYLOR G W
9- 248
TAYLOR GROVER M
9-3816
TAYLOR J J
9- 779 9-1656
TAYLOR J R
9-1254 9-1903 9-1904
TAYLOR J W
9- 170 9- 207 9-2340
9-3643
TAYLOR LAURISTON S
9-2122
TAYLOR LOIS L
9- 75
TAYLOR M P
9-3403
TAYLOR N H
9-1282
TAYLOR N W
9-1487
TAYSUM D H
9-2674
TECHNICAL COOPERATION PROGRAM
9-2415 9-3098
TECHNICAL INFORMATION BUREAU MINISTRY OF SUPPLY ENGLAND
9-2828 9-2829
TECHNICAL INFORMATION DIV LIBRARY OF CONGRESS
9- 55 9-2134 9-4063
TECHNICAL INFORMATION SERVICE AEC
9- 233 9- 288 9-2077
9-2100
TEICHROEW D
9-1033
TEILLAC J
9-2901
TEIS R V
9-2267
TEMMER G M
9- 354 9- 423
TEMPERLEY H N V
9-2803
TEMPLETON D H
9- 544
TENNESSEE UNIV
9- 185 9- 515 9-1156
9-1265 9-1807
TENNESSEE VALLEY AUTHORITY WILSON DAM ALA
9-1183 9-1445 9-1746
TENNEY GEROLD H
9-3816
TERLETSKII YA P
9- 455 9-1573 9-4222
TER MIKAELYAN M L
9-2495
TERNER I S
9- 49
TERRANI S
9-1615 9-2965
TERREAUX CH
9-1385
TERRY J E
9-1060
TESTERMAN M K
9-1579
TEUBNER F G
9- 9
TEWES HOWARD A
9-4288
TEXAS UNIV
9- 4
THACKRAY R W
9-1699
THACKWELL E J
9-3195
THATCHER L L
9-4082

THEILE HEINZ
9- 855
THEISMANN H
9-2602
THELLMANN EDWARD L
9-3201
THEODORIDES PHRIXOS J
9-3126
THEUS R B
9-3677
THEWLIS J
9-2374 9-2835
THIBAUD JEAN
9-1374
THIELKE N R
9-3844
THIELMAN HENRY P
9- 522
THIELSCH HELMUT
9-1888
THIRRING WALTER
9- 337 9- 740 9-1344
THOBURN J M
9-2161
THODE H G
9- 467
THOMAS ALBERT L JR
9-2354 9-2355 9-3775
9-4215
THOMAS ALEXANDER
9- 266 9- 267 9- 268
THOMAS HENRY C
9-2648
THOMAS JOHN G
9-2725
THOMAS L H
9- 69
THOMAS R G
9-1996 9-4055 9-4302
THOMAS W R
9-3186
THOMAS C JENKINS LABS
OF BIOPHYSICS
JOHNS HOPKINS UNIV
9- 374
THOMASON PAUL F
9-2633
THOMASSEN L
9- 962 9-3842
THOMPSON BOYD W
9- 306
THOMPSON CLARICE
9-2173
THOMPSON E C
9-1168
THOMPSON L C
9- 379
THOMPSON MARY E
9-3829
THOMPSON R W
9-2808 9-4255
THOMPSON ROY C
9- 12 9- 501 9-1703
THOMPSON S G
9-2021 9-4319
THOMPSON S O
9-4090
THOMPSON W B
9- 682
THOMPSON W M
9- 556
THOMSON JOHN F
9-3734
THOMSON LAB GENERAL
ELECTRIC CO
9- 968
THONEMANN P C
9-2403
THORNDIKE A M
9-2940 9-4257
THORNTON B S
9-2430
THORNTON J D
9- 589
THORWART W
9- 641
THOSAR B V
9-1123
THULIN SIGVARD
9-1412 9-1413 9-3247
9-3332
THUN R
9-1572
THURKAUF M
9-3429
THURSTON WILLIAM R
9-3157
TIBELL G
9-4004
TIDBALL ROBERT A
9-1806
TIDBURY D
9-1983
TIECKELMANN H
9-2614 9-2615
TIEN PING KING
9- 264
TIETZ T
9-2096
TILBE H E
9-4171
TILLMAN R M
9-2690
TILLU MAHADEO M
9- 81 9- 542
TILTON G
9-1835
TINSLEY R S
9- 596
TIPTON S R
9- 495
TISCH HENRY A
9-3216
TITTERTON E W
9-1701
TITTMAN JAY
9-3999
TIVEY HAROLD
9-3037
TOBAILEM JACQUES
9-2960 9-2962 9-3693
TOBIAS C A
9- 835
TOBIN RALPH
9-3990
TOBOCMAN W
9-1997 9-2095
TOCH PAUL
9-2596
TOCHILIN E
9-3938
TODD F C
9- 976 9-2722
TODHUNTER K H
9-2196
TOFT L H
9-3543
TOH TAIJI
9-2285
TOLBERT BERT M
9- 102 9- 305 9-3940
TOLER HERBERT R JR
9-1880
TOLHOEK H A
9-3324
TOLLESTRUP A V
9-3609
TOM SJ
9-1126
TOMASINI A
9-2003
TOMICEK OLDRICH
9- 523 9- 535 9- 536
9- 882
TOMITA KAZUHISA
9-1628 9-3617
TOMIZUKA C T
9- 197 9- 668 9-1278
TOMLIN D H
9-2739
TOMLINSON R H
9-2216 9-3691
TOMLINSON R L
9-3927
TONAWANDA LAB LINDE
AIR PRODUCTS CO
9-1041
TOOKER EDWIN W
9-1520
TOOR E W
9- 971
TOPP A C
9- 901
TOPPER L
9-3132
TORBERT JAMES F
9- 143
TORDA T P
9-4130
TORIBARA T Y
9-2675
TOUR SAM
9-2752 9-4194
TOURIN RICHARD H
9-3806
TOVE P A
9- 768
TOWNE SCIENTIFIC SCHOOL
UNIV OF PENNA
9- 176
TOWNES C H
9- 729 9- 811
TOWNSEND R G
9-3196
TOZER B L
9-3443
TRACERLAB INC
9- 266 9- 267 9- 268
9-2847 9-2848 9-3250
9-3930 9-3931
TRAINOR L E H
9-2468 9-2936
TRAPNELL B M W
9-2159 9-3887
TREACY P B
9-3626
TREADWELL W D
9-1207
TREES R E
9-2818
TREGO KATHERINE
9-2163
TREILLE P
9-3562
TREIMAN S B
9-1058 9-1988 9-1989
TREITLER THEODORE L
9-3772
TRENT T L JR
9- 569
TREUPEL H
9-1572
TREYBAL ROBERT E
9-3105
TRIFAN D S
9-2650
TRIMMER J D
9- 656
TRIPP A M
9- 557 9- 752
TRIPP R
9- 789
TRISTRAM D R
9-3400
TRITES ALBERT F JR
9-1520 9-4156
TRIVERO GIACOMO
9-2976
TRIVICH DAN
9- 519
TROIANO ALEXANDER R
9-1549 9-2763
TROMBE FELIX
9- 902
TROTTER C L
9- 622 9-1511 9-1827
9-3462
TROUT E DALE
9-2046
TROY W C
9-3538
TROYER MAX L
9- 627
TROZERA T A
9-2732
TRUELL ROHN
9- 280
TRUESDALE G A
9- 613
TRUM BERNARD F
9-2572
TRUMP J G
9- 250 9-1368
TRUMPY G
9-2481
TRUSWELL A E
9-1210
TSAI CHU
9-2811 9-3234
TSEITLIN KH L
9- 158
TSELLINSKAYA T F
9- 65
TSIKLIS D S
9-3239
TSIVOGLOU E C
9- 496
TSUKADA KINEO
9-1303 9-1340
TSUKKERMAN I I
9-2378
TSUZUKU TAKURO
9-2653
TUCKER CHARLES W JR
9- 428 9-1209
TUCKER J T JR
9-4196
TUCKER W D
9-1179
TUFTS COLL
9- 636 9-2333
TUGARINOV A I
9-2712
TUKEY H B
9- 9
TULLOCH E J
9-3871
TUPPER R
9-3379
TURGEON J C
9-2261
TURK ELTON H
9- 100
TURNBULL DAVID
9- 188 9-1864 9-3866
9-3867
TURNER D H
9-1850
TURNER L D
9- 575

TURNER R B
9- 508
TURNER S E
9-1322
TUTHILL SAMUEL M
9-1199
TYAPKIN A A
9-3607
TYREE S Y
9- 72
TYREN HELGE
9- 768 9-1410 9-2673

UDIN HARRY
9-1527
UEHLING EDWIN A
9-4009
UHLER ULLA
9-1227 9-1228 9-3798
UI HARUO
9- 404
ULM RICHARD W
9- 898
ULTEE CASPER J
9-1770
UNDERWOOD NEWTON
9-1951
UNGAR FRANK
9-1165 9-1166
UNGAR GEORGES
9- 830
UPHOFF DELTA E
9-2557
UPTON ARTHUR C
9- 20 9- 21 9- 492
9-2559 9-4047
UREY HAROLD C
9-3065 9-3226
URIVETSKY M
9- 124
URSENBACH W O
9-2364
USANOVICH M
9-3762
UTAH UNIV
9- 182 9-2262 9-3210
UTLAUT WILLIAM J
9- 289
UTTERBACK NYLE G
9-1599
UYEDA RYOZI
9-4232
UZHIK G V
9-1867

VACUUM-ELECTRONICS
ENGINEERING CO
9-2820
VAIL C R
9-1554
VAINSHTEIN B K
9-2033
VAINSHTEIN E E
9-3073
VAISBERG S E
9-2649
VAISMAN I A
9- 355 9- 742
VALADARES MANUEL
9- 381
VALCKX F P G
9- 406
VALIENTE E ALONSO
9-3075
VALLADAS G
9-2901
VALLE C F JR
9-4243
VALLETTA R M
9-2613
VAN ALLEN J A
9-1928
VAN ARKEL A E
9-2156
VAN ARTSDALEN E R
9-3221
VAN CLEVE A
9-1269
VANCOUR ROGER P
9-4247
VAN DALEN E
9-2215
VANDERHAEGHE G
9-2651
VAN DER LEUN C
9-3302 9-3303
VAN DILLA M A
9-2674
VANDONI ROBERT
9-2140
VANECHO JOHN A
9-1854
VANGO STEPHEN P
9- 75

VAN HECKE M F
9-2856
VAN HOVE L
9-2048
VAN KRANENDONK J
9-1012
VAN LIEMPT J A M
9-1536 9-1693
VAN NOOYEN B
9-3342
VAN PATTER D M
9- 794 9-1090 9-2073
VANRENNES ALBERT B
9-3388
VAN ROOSBROECK W
9- 251
VAN ROSSUM L
9- 325
VAN ROSSUM LUD
9-3271
VAN SOEST G
9-3220
VAN STIJVENDAEL M
9-2707
VAN UITERT LEGRAND G
9- 869
VAN VOAST JAMES
9- 208
VAN VUCHT J H N
9-3237
VARLEY J H O
9-3329 9-4315
VARMA JAGDISH
9-1347 9-1407 9-3335
9-4329
VARSHAVSKII YA M
9-2649 9-3784
VARTAPETIAN HAMLET
9-1327
VASENIN R M
9-1195
VASHAKIDZE I SH
9- 380
VASILYEV S S
9-4287
VASSAMILLET L
9- 971
VASTA JOHN
9- 228
VASTERLING H W
9-2601
VAUGHAN J D
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VAUGHAN W
9- 800
VAUGHEN J V
9-2623
VAUGHN W W
9- 702
VAWTER F J
9-3505 9-3506
VEALL N
9-2510 9-2869 9-3049
VECERA M
9- 80
VELORIC HAROLD SEYMOUR
9-3891
VELTMAN P L
9-1432
VENDRYES GEORGES
9-1093
VENKATESAN D
9- 257
VEOMETT ROBERT C
9-2115
VERGA V
9- 31
VERHAEGHE JULIEN
9-1411
VERLE I I
9-2085
VERLET L
9- 409
VERM R K
9-1932
VERMA M R
9-3072
VERMAESEN L
9-2852
VERNOV S N
9-3905
VERZAUX PIERRE
9-1374
VERZELE M
9- 120
VETTER KLAUS J
9-1868
VICKERS R C
9- 165
VICKERY R C
9-3430
VICTOREEN INSTRUMENT CO
9-3546
VIDAL GEORGES
9-2747
VIDNER PRENVSL
9- 523

VIDOVIC VLADO L
9-1733
VIENET R
9-3666
VIER DWAYNE T
9-1697
VIGLIONE JOSEPH
9-3500
VIGNERON L
9-3599
VIGON MARIA DE ARANZAZU
9-2857
VIGONE M
9-1624 9-1625
VILLI C
9-1068
VINCENT JAMES G
9-2115
VINE J D
9-2263
VINEYARD GEORGE H
9- 412
VIRGINIA-CAROLINA
CHEMICAL CORP
9-1792
VIRGINIA POLYTECHNIC
INST
9- 596 9-2208
VIRTS G
9- 115
VISWANATHAN ARUNACHALA
9-2748
VITA VAR CORP
9- 947
VITALE B
9-1569 9-2917
VITRO CORP OF AMERICA
9-3122
VLADIMIROVA I L
9-2681
VOCE E
9-2300
VOEVODSKII V V
9-2645 9-3780
VOIGT E M
9-2216
VOINO-YASENETSKII A V
9-2581
VOLAROVICH M P
9-2231
VOLCHOK HERBERT L
9-2004
VOLDRICH C B
9-1532 9-1851
VOLF E
9-1186
VOLKENSHTEIN F F
9-1930
VOLKENSHTEIN M V
9-1339
VOLKIN ELLIOT
9- 870
VOLKOV A B
9-3639
VON BORSTEL R C
9- 842 9-3024
VON BUTTLAR HARO
9-1698
VON DARDEL G
9-1387 9-1632
VON EULER H
9-3766
VON EULER HANS
9-3432
VON HALLE E
9-2838
VON WINBUSH S
9-3052
VORESS HUGH E
9-2077
VORRES KARL
9-2190
VORRES KARL S
9-3787
VOSS M D
9- 556
VREEDENBURGH C G J
9- 217
VYATSKIN A YA
9- 263
VZOROV I K
9-2491 9-2493

WABER JAMES T
9- 152 9- 155 9- 619
9- 620 9-1823 9-1824
9-3823
WACHTER JAMES P
9-2116
WACHTER JOHN W
9-1961
WACHTER M
9-1095
WADA MASAMI
9-1566

WADA W W
9-1631
WADDELL CHARLES
9- 767
WADDELL R C
9-2506
WADDINGTON C J
9- 724 9-1007
WADDINGTON GUY
9-1775
WADE E J
9-1308 9-1317 9-2827
WADIA DORAB R
9- 849
WADSWORTH MILTON E
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WAFFLER H
9-2038
WAGENAAR R O
9- 474
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9-2500 9-4330
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9-1091
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9- 274
WAGNER PAUL T
9-4022
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WAINER EUGENE
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WAIT E
9- 602
WAJDA E S
9-3188
WAJSBRUM JOSEPH
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9-1643
WAKERLIN R C
9-1727
WAKESHIMA HIROMU
9-2800
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9-2155
WALDEN J P
9- 167
WALDFOGLE E A
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WALDRON HAROL F
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WALKER B E
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WALL L A
9-3054 9-3082
WALL N S
9- 737 9- 762 9- 769
9-1946 9-2937
WALLACE E K
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WALLACE J J
9- 569
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9-2272
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WALLACE W E
9- 637 9-2735
WALLACE W P
9- 799
WALLIS R F
9- 801
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WALSH JOHN M
9- 987 9-3876
WALSH KENNETH ALBERT
9- 169
WALTERS W R
9-1500
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WALTON G N
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WANG JUI H
9-1187 9-1229 9-2151
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9-3668 9-3689 9-3690
9-4018
WARD A H
9- 443 9- 710 9-2114
WARD E
9- 206
WARD M
9-1230
WARDLE R
9-4180
WARHEIT I A
9-2504
WARMOLTZ N
9-1328
WARNER GEORGE F
9-2689
WARREN B E
9-2496
WARREN J M
9- 4
WASE ARTHUR W
9-1732
WASHBURN JACK
9- 163 9- 970
WASHINGTON RESEARCH LABS
NATIONAL CANNERS
ASSOCIATION D C
9- 11
WASHINGTON UNIV ST LOUIS
9-2360
WASILEWSKI R J
9- 981 9-2339
WASSERBURG G J
9-1915 9-3463
WASSERSTEIN B
9-1233
WATAGHIN G
9-1069 9-1625
WATAGHIN V
9-1095
WATANABE DENJIRO
9- 205
WATANABE HIROSHI
9-1655
WATANABE K
9-1293
WATANABE MOTOO
9-3763
WATANABE Z
9- 384
WATERFIELD R L
9-2700
WATERTOWN ARSENAL LAB
9-1535 9-2283 9-2284
9-2299 9-4247
WATROUS R M
9-2671
WATSON KENNETH M
9-3681 9-4008
WATSON R H
9-3419
WATT GEORGE W
9-1208
WATTENBERG A
9-1336 9-2882
WATTS A A
9-1837 9-1875 9-3492
WATTS H V
9-1977
WATTS R W E
9-3379
WATZEL R
9-2618
WAUGH ROBER C
9-2316
WAY JAMES LEONG
9-1449
WAYNE UNIV
9- 519 9-3814
WEALE J W
9-2974
WEAVER BOYD
9- 901
WEBB BRUCE P
9- 161
WEBBER HENRY A
9-2780
WEBELER R
9- 782
WEBER A
9-3454
WEBER E P
9-3496
WEBER J H
9- 141
WECHSLER M S
9-3885
WEDOW HELMUTH JR
9-1523
WEECH M
9-3289
WEEKS ALICE D
9-3829
WEEKS BOYD M
9-2197
WEEKS JAMES L
9-1879
WEEKS JOHN RANDEL
9-2251
WEEKS MAURICE H
9- 501 9-1703
WEGNER HARVEY E
9-1054
WEIBLEN D G
9-2186
WEIDENBAUM SHERMAN S
9-1472
WEIGLE KEITH E JR
9-3047
WEIK MARTIN H
9-1018
WEIL GEORGE L
9-2912
WEILAND WALTER F
9-4131
WEILL ADRIENNE R
9-1882
WEILL JACKY
9- 318 9-1082 9-2909
WEILL R
9-1056
WEINBERG A F
9-2386 9-3166
WEINBERG S J
9-3005
WEINIG S
9- 200
WEINMAN E O
9-1447
WEINTRAUB MURRAY
9-3134 9-4126
WEINTRAUB SOLOMON
9- 839
WEIR CHARLES E
9- 863
WEISBERGER S
9-3513
WEISER D W
9-1500
WEISER LOIS A
9- 621 9-3461
WEISMAN JOEL
9-2692 9-3285
WEISMAN T H
9-1461
WEISS J
9- 108
WEISS RICHARD
9-4224
WEISSBERG HAROLD L
9-3445
WEISSKOPF V F
9- 351
WEISSMANN SIGMUND
9-1208
WEISZ HERBERT
9-1786 9-3781
WEITZEL D H
9-3399
WELCH G A
9-1230
WELCH J H
9-1589
WELLER G S
9-1103 9-2028
WELLS F H
9-2349
WELLS G F
9- 921
WELLS R A
9-3404
WELTER GEORGE S
9-2315
WENDLANDT WESLEY W
9-2667
WENESER J
9-4270
WENK P
9- 193
WENNERBERG ANN
9-4104
WENNERSTRAND BERTIL
9- 543
WENTWORTH R L
9- 520 9- 521 9-3381
WENTZ W W
9-2296
WENZL F
9-4225
WERNER FRANK D
9-3578
WERNER R C
9-4179
WERNET J
9-2148
WERNING JOSEPH R
9- 907
WERTHEIM M S
9-1414

WEST E D
9-1252
WEST H I JR
9- 312
WEST J B
9- 586
WEST PHILIP W
9-2169 9-3436
WEST VIRGINIA UNIV
9-4057 9-4094
WEST WALTER S
9- 628
WESTENDORP W F
9-1370
WESTERN GEAR WORKS
9-1817
WESTERN RESERVE UNIV
9- 726
WESTERVELT DONALD R
9- 852
WESTINGHOUSE ATOMIC POWER DIV
9- 429 9- 779 9-1656
9-2742
WESTINGHOUSE ELECTRIC CORP
9- 974
WESTINGHOUSE RESEARCH LABS
9-1935
WESTLAND G J
9-2168
WESTRUM E F JR
9-1231
WETHERILL GEORGE W
9- 626
WEVER H
9-4214
WEXLER S
9-2005
WEYMOUTH PATRICIA P
9-2558
WHALIN E A JR
9-2469
WHALING WARD
9- 794
WHALLEY E
9-3573
WHATLEY M E
9- 592
WHEELER C M
9-4145
WHEELER CHARLES M JR
9-2679
WHEELER H L JR
9- 630
WHETSEL H B
9- 902
WHIPPLE G HOYT
9-4049
WHITE A O
9-3288
WHITE A S
9- 591
WHITE CHARLES E
9-1895
WHITE CLAYTON S
9- 877 9-3359 9-3360
WHITE DAVID
9-3081
WHITE F A
9-2401
WHITE HOWARD J JR
9- 922
WHITE J C
9-3411
WHITE JULIUS
9-2568 9-2569
WHITE L E
9-3399
WHITE LOCKE JR
9-3775
WHITE ROBERT L
9-2647 9-2985
WHITEHEAD C
9- 764
WHITEHEAD THOMAS NORTH
9-2836
WHITEHOUSE DAVID R
9-3589
WHITING ANNA R
9-2573 9-2592
WHITING F B
9-3587
WHITMORE G F
9-1978
WHITNEY RAE
9- 22
WHITTEMORE W L
9-2940 9-4257
WHYARD R E
9-2869
WHYTE G N
9-2490
WICKE E
9- 894
WICKERSHAM ARTHUR F
9- 377
WICKHAM R J
9-1041
WICKHAM ROBERT
9-3197
WIEDENBECK M L
9- 439 9-2062
WIEDERKEHR V R
9-4074
WIEDLING T
9-3669
WIEGAND C
9- 789
WIESNER J B
9- 652 9-4210
WIGNER EUGENE P
9-3712 9-3713 9-4335
WIIG EDWIN O
9-1091
WILCOXON FRANK
9-2846
WILD JOHN J
9-2541
WILD WOLFGANG
9- 466
WILDE WALTER S
9-3032
WILDER D R
9-1213
WILDERMUTH KARL
9- 466
WILDING JAMES L
9- 13 9-2572
WILES D M
9-3691
WILES DONALD R
9- 670
WILETS LAWRENCE
9-2902
WILEY R C
9-3658
WILHELM H A
9- 586
WILHELMY ERNEST
9-1158
WILKE C R
9-3222
WILKHAMMER G A
9-4171
WILKINS J ERNEST JR
9-2472
WILKINS J J
9-3656
WILKINSON D H
9- 363 9-3299 9-3645
WILKINSON G
9-3096
WILKINSON M K
9-2312 9-3218
WILKINSON PAUL R
9-4057 9-4094
WILKINSON ROGER G
9-1404
WILLGING J F
9-2255
WILLIAMS A J
9-1532
WILLIAMS CHARLES M
9-2249
WILLIAMS D D
9- 635 9-1466
WILLIAMS DALE G
9-2163
WILLIAMS E S
9-1046
WILLIAMS FLETCHER P JR
9-2553
WILLIAMS G I
9-3353
WILLIAMS GORDON C
9-3380
WILLIAMS H J
9-1254 9-1903 9-1904
WILLIAMS J A
9-3790
WILLIAMS JOHN H
9-4301
WILLIAMS M
9-3593
WILLIAMS M C
9- 801
WILLIAMS R
9-2624
WILLIAMS R A
9-4058
WILLIAMS R D
9-1851
WILLIAMS R E
9-1838 9-1847
WILLIAMS W LEE
9-3145 9-3168 9-3169
9-3659
WILLIAMSON ARTHUR E JR
9-2354 9-2357
WILLIS H H
9- 906 9-3427
WILLMORE TRACY A
9-4137 9-4139
WILLMS M
9-1718
WILLOUGHBY G
9-1498
WILMS G R
9- 202
WILSKA SEPPO
9-2619
WILSON A S
9-2726
WILSON C W
9- 46
WILSON E BRIGHT JR
9-2438
WILSON E E
9- 702
WILSON G ELIZABETH
9-3795
WILSON HERBERT B
9-1731
WILSON J G
9-2364
WILSON M KENT
9- 944 9-3080
WILSON R R
9-1442
WILTSHIRE L L
9-3721
WILZBACH K E
9- 541 9-3057
WINAND L
9-2810 9-2858
WIND G
9-2862
WINDERS G R
9- 554 9- 558 9- 931
WINDING C C
9-3132
WING A B
9-1945
WINKELMANN ALBERT
9-2782
WINKLER O
9- 195
WINKLER W
9-1667
WINSBERG LESTER
9-1057
WINSLOW GEORGE H
9-1125 9-2949
WINSTON A
9-2882
WINSTON R E
9-3138
WINTER J
9-4186
WINTER J A
9-3755
WINTER JACQUES
9- 366
WINTERINGHAM F P W
9-3263
WINTERS PAUL H
9-1047
WINTERSTEIGER V
9- 435
WINTERSTEIGER VELJKO Z
9-1072 9-1884
WIRTZ K
9-3640
WISCONSIN UNIV
9-1964 9-2132 9-2412
WISEMAN CARL D
9-3521
WITHINGTON C F
9-4151
WITTELS M C
9-2831
WITTEN VICTOR H
9- 836
WITTKE J P
9- 454
WITTWER S H
9- 9
WLODEK STANLEY T
9-4162
WODINSKY ISIDORE
9-1178
WOHLAUER GABRIELE
9-2138
WOLFE R A
9-1430 9-1550
WOLFENDALE A W
9- 326
WOLFENSTEIN L
9-1660
WOLFF JAY R
9-1031
WOLFF RUSSELL H
9- 147
WOLFF SHELDON
9- 842
WOLFSBERG MAX
9-1682
WOLLAN E O
9-1067 9-3344
WOLLMAN SEYMOUR H
9-1178 9-2543

WOLPERS C
9-1707
WOLSTENHOLME B
9-2196
WONG J B
9-3558
WONG JAMES
9-1527
WOOD D F
9-1198
WOOD D S
9- 634
WOOD E
9-3697
WOOD F W
9-4167
WOOD JOHN H
9- 516 9- 598
WOOD M R
9- 696
WOOD SCOTT E
9-1220 9-1221
WOOD WILLIAM W
9- 995
WOODFIELD F W
9- 588
WOODRUFF L V
9-2027 9-2030
WOODS W W
9-2690
WOODWARD E C
9- 453
WOODWARD J B
9-2479 9-2480
WOODWARD L A
9-1137
WOODWARD V W
9- 475
WOOLF A A
9-2158 9-2187 9-3415
9-3416
WOOLLEY R L
9-2771
WORK LINCOLN T
9-3232
WORKMAN B J
9-1103 9-2028
WORKS CONTROL LAB
BABCOCK AND WILCOX CO
9- 632 9- 939
WORMALL A
9- 510 9-3379
WORNER H W
9-2766
WORSNOP B R
9-2128
WORTHAM J
9-1463 9-1464
WORTHINGTON R E
9-2189
WOTRING A W
9-1236
WOUTERS L
9-1320
WRIGHT C A H
9-1435
WRIGHT D J
9- 892 9-1272
WRIGHT DOROTHY J
9- 239 9- 240 9- 241
WRIGHT G T
9- 707 9-1605
WRIGHT HAROLD D
9- 621 9-1826 9-3461
WRIGHT I F
9-2964
WRIGHT K A
9-1366
WRIGHT MARY D
9-1808
WRIGHT ROBERT W
9-3253
WU TA-YOU
9-2381
WULFF JOHN
9-1527 9-3457 9-4162
WYCKOFF H O
9-3373
WYLD H W JR
9-1662
WYLER E N
9- 976 9-2722
WYLIE R D
9- 939
WYMAN LELAND C
9- 22
YAFFE L
9- 467 9-1613 9-3603
YAGODA HERMAN
9-3592 9-4220 9-4256
YALE UNIV
9-1414
YALOW A AARON
9-1173
YAMAGUCHI YOSHIO
9- 405 9-4327
YAMAMOTO ALBERT S
9-3517
YAMATERA HIDEO
9- 93
YANAGIHARA TADASHI
9-4199
YANKEE W R
9-1269
YANKWICH PETER E
9- 871 9- 900
YANOSHI I L
9-1919
YARNELL RICHARD A
9- 25
YASAITIS E L
9-1778
YASIN M
9- 724
YEARIAN H J
9- 949
YEIVIN YEHUDAH
9-3269
YERKOVICH L A
9-3503 9-3504
YNTEMA J L
9-2485
YOCKEY H P
9- 430
YOCOM J E
9-1798 9-1799 9-1800
9-1801
YONTS O C
9-2794
YORK CARL M JR
9-1607
YOSHIDA SHIRO
9-1690
YOSHIKAWA SADAE
9-2002
YOSHIMURA KIYOSHI
9-3765
YOUDEN W J
9-1130
YOUNG A P
9-3863
YOUNG D J
9-2961
YOUNG D M
9-2677 9-4245
YOUNG J E R
9-1670
YOUNG S A
9- 792
YOUNG V E
9-2784
YPSILANTIS T
9- 789
YUAN LUKE C L
9-4248
YUASA T
9- 807
YUASA TOSIKO
9-2080 9-2959 9-2963
YUE A S
9-3428
YURKOV V A
9-1869
YUTSIS A P
9-2085 9-2087
ZABIELSKI CHESTER
9- 598
ZACHARIASEN W H
9- 904 9-2225 9-2226
9-2227 9-2372 9-3802
ZACHARIASEN W H
9- 848
ZAFFARANO D J
9-1037 9-1121 9-1680
9-2951 9-3242
ZANDBERG E YA
9-2933
ZAPFFE CARL A
9- 963
ZAPP KARL HEINZ
9-1273
ZAPPA L
9- 387 9-1615 9-2963
ZARESKI GORDON K
9-1513
ZARUBIN P P
9-2068 9-2069
ZATSEPIN G T
9-2366
ZAUKELIES D A
9- 662 9-2130
ZAVARZINA N B
9-3358
ZAVOISKII E K
9-2860 9-4248
ZAYAN S EL-DIN
9-2686
ZELDES HENRY
9-1687
ZELLER HOWARD D
9-2263 9-3466
ZENGER JERRY H
9-3936
ZHARKOV G F
9- 722 9-2084
ZHDANOV A P
9-3559
ZHDANOV G B
9-1920
ZHUKOVSKII N N
9-1970
ZHVANKO YU N
9-1933
ZIGMAN P E
9- 658
ZIJP W L
9-1126
ZILBERMAN G E
9-1574
ZIMMERLUND G
9-3766
ZIMMERMAN E J
9-1394
ZIMMERMAN S F
9- 739
ZIMMERMANN H J
9- 652 9-4210
ZINDLER G F
9-1951
ZINN W H
9-1357
ZIRIN HAROLD
9-3995
ZOBEL W
9-3262
ZOMBKOVSKII S M
9-2935
ZUBER NOVAK
9- 936
ZUCKER A
9- 421 9-1648 9-1649
ZUCKER EVA F
9-1151
ZUKRIEGELOVA MARIE
9- 535
ZVANUT A
9- 220
ZWEIFEL P F
9- 417 9-1674 9-2927
ZWEIG GUNTER
9-3076
ZWIKKER CORNELIS
9-2338
ZYZES F C
9- 154 9-1822

NUCLEAR SCIENCE ABSTRACTS

Volume 9 — January 15 — June 30, 1955 — No. 12B

SUBJECT INDEX

The number followed by a colon is the volume number, and the numbers following are the abstract numbers. The designation (R) following an abstract number indicates that it is an abstract of a progress report; the designation (J) indicates that it is an abstract of a journal (published literature) article; and the designation (P) indicates that it is an abstract of a patent. Abstract numbers for reports other than progress reports carry no letter designations.

A

Abdomen

x-ray transmission through, in living subjects, comparative studies, 9: 3039(J)

Absorption

(See also appropriate subheadings under materials absorbed; see also Adsorption.)

effects of hydrochemical conditions, 9: 1791

Accelerator targets

(See Radiation targets.)

Accelerator tubes

electrical properties of helical, for linear accelerators, 9: 1372(J)

shunt impedance of helical, for proton linear accelerator, 9: 1373(J)

Accelerators

(See also Betatrons; Bevatron; Brookhaven Synchrotron; Calutrons; Cockcroft-Walton accelerators; Cyclotrons; Linear accelerators; Synchrocyclotrons; Van de Graaff accelerators.)

alternating gradient channel in, using permanent bar magnets, 9: 395

electron, and high-resolution analyzer for absorption studies, 9: 3665(J)

high-energy book on, 9: 3992(J)

liquid H, D, and He targets for use with high-energy, 9: 2469(J)

Accelerometers

design and performance of, for determination of sinusoidal acceleration at peak levels near that of gravity by chatter method, 9: 273

Acetaldehyde, dichloro-

polarographic determination, 9: 539(J)

Acetals

reaction of 2,2,3,3,4,4-hexafluoro-1,2-propanediol with butyl formal, 9: 1767(R)

Acetates

(See also specific acetates.)

degradation of C^{14}-labeled, using a combined combustion-diffusion vessel, 9: 2178(J)

Acetic acid

adsorption of, by polyvalent forms of anion-exchange resins, 9: 2212(J)

aqueous solution, effects of heavy-particle radiation on, 9: 2197

exchange of D and, effects of nitro compounds on, 9: 2182(J)

glacial, reductometric titrations in, 9: 536(J)

glacial, titrations in, based on formation of insoluble salts, 9: 535(J)

radiation chemistry, 9: 2551(R)

vapor phase association of D-labeled, 9: 3409(J)

Acetic acid, amino-

(See Glycine.)

Acetic acid, chlorocresoxy-

separation of Th from cerite earths by, 9: 594(J)

Acetic acid 2,4-dichlorophenoxy-

use in separation of Th from Zr, Ti, and Fe, 9: 2641(J)

Acetic acid, (ethylenediamine)tetra—

determination of uranyl ion by chelation with, 9: 3436(J)

effects of, on chromosome rearrangement in Drosophila, 9: 2099(R)

high-frequency titrations of divalent metals using, 9: 2169(J)

Acetic acid, (ethylenediamine) tetra-, rare earth salts

solubilities of, 9: 3428(J)

Acetic acid (ethylenediamine) tetra-, sodium salts

as analytical reagent for Co and Cr, 9: 4086(J)

Acetic acid, mercapto- complexes

autoreduction, spectrophotometric studies, 9: 4205(R)

Acetic acid, trifluoro-

compounds of sodium trifluoroacetate with D-labeled, infrared spectra, 9: 3084(J)

compounds with sodium trifluoroacetate, hydrogen bonding, infrared spectra, and heat of dissociation, 9: 3084(J)

Acetic acid, trifluoro-, sodium salts

compounds with D-labeled trifluoroacetic acid, infrared spectra, 9: 3084(J)

compounds with trifluoroacetic acid, hydrogen bonding, infrared spectra, and heat of dissociation, 9: 3084(J)

infrared spectra, 9: 3084(J)

Acetic acid, trifluorothiol-, ethyl esters

acetylating property of, for amino acids and peptides in aqueous solution, 9: 123

Acetic acid, triphenylethyl esters

mechanism of Wagner-Meerwein rearrangement in, 9: 1755(J)

triple-labeling experiments on isotope position isomerization of, 9: 1756(J)

Acetone

fundamental vibrations of, 9: 917(J)

Acetone, acetyl-

(See 2,4-Pentanedione.)

Acetone, hexafluoro-

synthesis and vapor pressure, 9: 3085(J)

Acetone, thenoyltrifluoro- —butyl phosphate—kerosene systems

solvent extraction of Pr and Nd in, 9: 906

Acetone, thenoyltrifluoro- chelates

formation of, with 3 ions of elements 95 through 100, 9: 924(J)

Acetylene

infrared spectrum and molecular constants of C_2D_2, 9: 1766(J)

radiation chemistry, 9: 2662(J)

Acetylene, chloro-

quadrupole coupling of deuterons in D-labeled, 9: 2647(J)

Acid fluoride ions

divalent hydrogen in, 9: 2185(J)

Acids

(Limited to general or over-all reports on acids; see also specific acids.)

adsorption of, by polyvalent forms of anion-exchange resins, 9: 2212(J)

definitions of concepts of, 9: 3056(J)

determination of free, in Pu solutions, 9: 4110

theory, 9: 3762

Acrylonitriles

effects of γ radiation on polymerization of monomers of, 9: 2847(R)

Actinide oxides

heat and free energy of formation, 9: 529(J)

Actinides

(Type 5f rare earths; see also specific elements; see also Rare earths; Transplutonic elements; Transuranic elements.)

absorption spectra of ions of, with two 5f-electrons, 9: 3001(J)

Actinium

bibliography, 9: 3551

boiling point and vapor pressure at 1,600°C, 9: 54

chelation with thenoyltrifluoro- acetone, 9: 924(J)

ion exchange of, from Th at high temperatures, 9: 593(J)

melting point, 9: 1757(J)

preparation of, by reduction of actinium fluoride with Li vapor, 9: 1757(J)

separation from Fr^{223} by paper chromatography, 9: 1225(J)

Actinium fluorides

reduction of, with Li vapor to prepare Ac, 9: 1757(J)

Actinium isotopes Ac^{227}

decay scheme, 9: 2952

half life, 9: 2960(J)

separation from rat urine, 9: 2671

Actinium isotopes Ac^{228}

period of 57-kev level, 9: 442(J)

Activation analysis

(See also Radiometric analysis.)

a comparison of, with other analytical methods, 9: 2170(J)

Adenine

incorporation of, into nucleic acids, effects of tumor growth, x radiation, and 8-azaguanine on, in mice, 9: 1449(J)

incorporation of, into nucleic acids, tracer study, 9: 3377

metabolism of, in mice, tracer study, 9: 2608

metabolism of labeled, by rats, 9: 61(R)

Adenosine, methylthio-

biosynthesis, 9: 2547(R)

Adenosinephosphoric acids

hydrolysis of, mechanism, 9: 473(J)

Adenylic acid

(See Adenosinephosphoric acids.)

Adhesion

of air bubbles to hydrophobic surfaces in water, theoretical analysis of, 9: 148(J)

Adhesives

performance of Epon VI, for glass-to-metal joints, 9: 1368

Adhesives (cont'd)

for plastic-to-plastic and plastic-to-Al joints, effects of temperature on bond strengths, 9: 651

properties, 9: 4114(R)

sonic inspection of bonding of sheet metal with, 9: 1263(R)

Adrenal glands

cortical activity of, effects of x radiation on, in rats, 9: 3365

effects of x radiation on growth and histochemistry of transplants of, in rats, 9: 22(J)

influence of, on mast cell number in skin of rats, 9: 3(R)

isolated calf, effects of irradiation on cortical function and morphology, 9: 1166(J)

isolated calf, effects of irradiation on steroidogenesis in, 9: 1165(J)

Adrenaline

effects of, on liver blood flow, tracer study, 9: 2609

Adsorption

(See also as subheading under materials adsorbed; see also Absorption.)

determination of pore size distribution and surface area from isotherms, 9: 2216(J)

electronic levels of atoms adsorbed on surface of a crystal, 9: 1930(J)

of gases, interaction of a molecule with the surface of a solid, quantum theory, 9: 3433(J)

and ion exchange in metal-metal ion systems, review, 9: 121(J)

physical, reversibility in, 9: 3113(J)

properties of, effect of basic structural types of adsorbents on, 9: 911(J)

review, 9: 3063(J), 3114(J)

Aerodynamics

(See also Boundary layer; Fluid flow; Gas flow; Supersonic flow.)

investigation of compression shocks and boundary layers in gases moving at high speed, 9: 1014(J)

Aerosol generators

design, 9: 2357(R)

performance, 9: 3360

for preparation of water aerosols, design and performance, 9: 3359

for production of monodisperse liquid or solid aerosols, design, 9: 531

Aerosols

(See also Colloids; Fog; Particles; Powders; Smokes.)

aggregation, effect of physical properties, 9: 3904(R)

biological, effects of suspending fluids on particle size distribution, 9: 4041

coagulation and settling in turbulent gas flow, theory, 9: 2359(J)

collection of, performance of centrifugal scrubbers for, 9: 4125(J)

deposition of, by electrostatic forces from a moving stream, 9: 934

detection, design of a photometer for, 9: 4215

detection, performance of a photometer for, 9: 3775(R)

diffusion formulas and pollution problems, 9: 4216

filtration of radioactive, using glass fibers, 9: 1491(J)

growth of particles in a turbulent supersaturated fluid, 9: 1912

halide ion–water, sampling surface for, 9: 1001(J)

impaction on cylinders, 9: 3558(J)

monitoring of toxic dusts and fumes, 9: 1913(J)

monodisperse solid, filtration, 9: 531

particle size measurement, 9: 253(J), 819

particle size measurement, design of a photometer for, 9: 4215

particle size measurement, equipment, 9: 2354(R), 2355(R), 2356(R), 2537(R), 3359

review, 9: 3063(J)

sampling, importance of sampling periods, 9: 4042

sampling equipment, design, 9: 3721

Aerosols (cont'd)
size reduction, review, 9: 3232(J)

Air
(See also Atmosphere; Breath; Gases; Meteorology; Stack disposal; Ventilation.)
aerosol diffusion formulas and pollution problems, 9: 4216
alpha particle ranges and straggling in, 9: 782(J)
analysis of, for O_2, survey of methods, 9: 77
angular neutron scattering cross sections of, 9: 1103
compressible flow of, selection of graphs for use in calculations of, 9: 3139(J)
design and performance of wet dust scrubbers to prevent pollution of, 9: 3091(J)
energy loss of secondary electrons in, effects of various cavity wall materials on, 9: 2045(J)
equation of state of, on the Thomas-Fermi statistical model, 9: 3211
evaporation of spherical drops of liquid falling in, 9: 1015(J)
fiberglass filters for, of hot laboratories, performance, 9: 549
filtering of hot-lab, by glass wool filters, 9: 560(J)
gamma scattering by, special distribution of, 9: 1104
ion pair formation, 9: 4039(R)
ionization chamber for radioactivity measurements, 9: 1326(J)
pollution of, bibliography, 9: 7(J)
radioactivity after atomic explosions, in France, 9: 2536(J)
sampling, importance of sampling periods, 9: 4042
sampling techniques, 9: 2130
scattering of molecules of, from surfaces, 9: 650
single scattering in air, Monte Carlo evaluation, 9: 2926
single scattering of neutrons in, 9: 2028
solubility in water, instrument for measuring, 9: 3068
spectrophotometric analysis of, for boron hydrides, 9: 3069
thermal conductivity and viscosity of, from 0 to 600°C, 9: 2822

Air flow
(See Gas flow.)

Air Force Radiation Lab., Univ. of Chicago
progress reports on biological research, 9: 480(R), 2548(R)

Aircraft reactors
shielding design, 9: 2027, 2030

Alanine, leucyl-
preparation, 9: 2136(R)

Alaska
exploration and U distribution, 9: 628(J)
occurrence of Th minerals in, 9: 1523(J)

Albumins
biosynthesis of C^{14}-labeled, 9: 2105(J)
self-diffusion coefficients of ovalbumin in aqueous ovalbumin solutions, tracer study, 9: 1229(J)

Alcohols
(See also specific alcohols, e.g. Methanol.)
aliphatic, hydrogen exchange between triphenylcarbinol and, 9: 2331(R)
radiation decomposition of, 9: 102

Algae
culturing P^{32}-labeled, 9: 3358(J)
phosphate metabolism, tracer study, 9: 3(R)

Alginates
viscosity of, effects of radiation and of radiomimetics, 9: 2658(J)

Alice Claim (Calif.)
geology, 9: 3837(J)

Aliphatic compounds
adsorption on Ag and Cu from aqueous solutions as inferred from H_2 overvoltage measurements, 9: 595(J)

Alizarin Red S complexes
with thorium, chemical properties, 9: 875

Alkali metal chlorides
thermodynamic properties of $MgCl_2$ in fused, 9: 3768(J)

Alkali metal halide crystals
fluorescence and thermoluminescence in x-irradiated, 9: 3682(J)
photoconducting, capacitance and conductance effects in, 9: 2816(J)
pure and hydride containing, F centers in, 9: 2369(J)

Alkali metal–alkali metal halide systems
properties of, in thermal equilibrium, 9: 852

Alkali metal halides
effects of fast-electron irradiation on, 9: 3329(J)
emission excitation, and absorption spectra of Ag-activated, 9: 3116(J)
luminescence, when activated by heavy metals, 9: 1784
microwave spectra of, molecular properties determined from, 9: 811(J)
photostimulated emission of activated, 9: 2424(J)
reaction with B_2O_3 to prepare B halides, 9: 598

Alkali metal oxides
colored, theoretical analysis, 9: 4067(J)
heat and free energy of formation, 9: 529(J)

Alkali metals
compressibility parameters and Grüneisen's constants, 9: 1863
conductometric determination by paper chromatography of chloride and perchlorate ions in, design and performance of apparatus for, 9: 2215(J
rigid solution of, solvated electrons and radicals in, 9: 864(J)
separation by anion exchange using EDTA and Dowex-1 resins, 9: 2214(J
thermoelectric power in liquid ammonia, 9: 1911(J)

Alkaline earth halides
reaction with B_2O_3 to prepare B halides, 9: 598

Alkaline earth metals
anion-exchange separation of, in citrate solutions, 9: 2213(J)

Alkaline earth oxides
heat and free energy of formation, 9: 529(J)

Alkaline earth uranates
crystal chemistry, 9: 2372(J)

Alkenes
radiation chemistry, 9: 2662(J)

Alkyl chlorides
effects of radiation on, 9: 3888(R), 3889(R)

Alkyl fluorides
hydrolysis and stability of, 9: 893(J)
preparation of n-pentyl fluoride, 9: 2131

Alkyl halides
hydrolysis by H_2O and D_2O, rates of, 9: 2646(J)

Alkyl iodides, perfluoro-
synthesis of conversion to organometallic and organometalloid compound 9: 893(J)

Allegheny Formation (Penna.)
geology, 9: 164(J)

Allegheny Ludlum Steel Corp.
progress reports on research and development of wrought and cast high temperature alloys, 9: 3488(R)

Alloys
(See also specific alloys, intermetallic compounds, and systems, which are indexed with components arranged both in alphabetical and reversed orders.)

Alloys (cont'd)

binary, slide rule for converting atomic percent to weight percent, design and performance, 9: 3170

corrosion by liquid NaOH at 1000 and 1500°F, 9: 1508

corrosion resistance and applications of construction, survey and directory of, 9: 137(J)

cost ratings of various, 9: 2254(J)

diffusion and oxidation of, review, 9: 3206(J)

disordered, energy levels of, 9: 2777(J)

ferrous and nonferrous, atmospheric corrosion, 9: 3824

film formation, mathematical analysis, 9: 3884(J)

intermediate phase studies and melting temperatures of Laves-type, 9: 2721(R)

intermediate phase studies and valence calculations of transition metals of Laves-type, 9: 2736

irradiation disordering of, mechanism, 9: 4012(J)

melting point, as a remote temperature measuring device, 9: 2335

nuclear magnetic moments, 9: 2895

number of vacancies and energy of vacancy formation in, 9: 3525(J)

polarographic analysis, 9: 3402(J)

relaxation strength of, theory, 9: 1537

weld crack sensitivity of light, effects of separation stresses, form of separation of intermediate phases, shrinkage cavities, and unusual shrinking stresses on, 9: 196

Alpha decay

calculated wave amplitudes near the nucleus, 9: 2949

disintegration energy for heavy nuclei, formula, 9: 3692(J)

fine structure, high-resolution ion pulse analyzer for study of, 9: 3595(J)

fine structure in, 9: 2502

half lives, correlation with spontaneous-fission half lives, 9: 362(J)

relation to nuclear shell model, 9: 1999(J)

review, 9: 4020(J)

of spheroidal nuclei, 9: 2136(R)

table of disintegration energies for heavy elements, 9: 806(J)

theory of, using a surface well potential, 9: 1125(J)

Alpha particles

(See also subheadings concerning alpha emission and alpha reactions under specific elements, isotopes, and compounds.)

biological effects of, compared with effects of x radiation, in mice, 9: 2564(J)

biological effects of, compared with effects of x radiation on yeasts, 9: 3364

chemical effects of, on aqueous solutions, 9: 580(J)

collision of high-energy, with nuclei, 9: 1667

in cosmic radiation, determination of, 9: 1007(J)

in cosmic radiation near geomagnetic equator, 9: 1292(J)

detection and measurement, performance of monitoring instruments, 9: 3268(J)

detection and measurement, performance of portable battery-driven monitor, 9: 3933

detection and measurement of, by kinetic nucleography, 9: 713(J)

detection and measurement of, from photonuclear reactions, 9: 1037

detection and measurement of, from U and Pu, 9: 1598

detection and measurement of, in determinations of thickness, 9: 1236

detection and measurement of, instruments, and respiratory deposition and retention, 9: 4048

detection and measurement of, with scintillation detectors, 9: 697

detection with ZnS screens, 9: 3600(J)

directional correlations (α-γ), increased efficiency with liquid film sources, 9: 321(J)

Alpha particles (cont'd)

disintegration energy of, for heavy nuclei, formula, 9: 3692(J)

effects of, on H_2O_2 and HCl-H_2SO_4 mixtures, inhibitory action of Cl^-, 9: 581(J)

effects on creep and hardness of Cd crystals, 9: 433(J)

effects on surface properties, 9: 2052(J)

elastic scattering of 22-Mev, from Ag, Au, and Pb, 9: 2937(J)

elastic scattering of protons and deuterons by, 9: 410(J)

emission from granites, limestones, bentonites, building materials, ground waters, and plants, 9: 445(J)

emission of, from excited nuclei by protons of 50, 100, 150, and 450 Mev, 9: 2917(J)

energy levels of, from H^3 + p reaction, 9: 741(J)

energy-momentum tables, 9: 402

floor monitor for, design, 9: 302

inactivation of poliomyelitis virus with, 9: 3737(J)

interactions in nuclear emulsions, 9: 3966(R)

ionization in pure gases by, determination of average energy to produce ion pairs, 9: 3899(J)

ionization of A, CO_2, and N_2, 9: 1994(R), 4266(R)

ionization of argon by 5-Mev, 9: 780(J)

ionization of gases by, 9: 2539(R), 2821

oxidation and reduction of ceric salts by, 9: 1215(J)

oxidation and reduction of cerous-ceric system by, role of oxygen radicals in, 9: 1214(J)

oxidation of phosphite ions by, 9: 582(J)

radiation hazards from, in laboratory, control, 9: 4049

ranges and straggling of low-energy, in air, 9: 782(J)

ranges in materials, prediction, 9: 2928

relative biological effectiveness of, in mammalian systems, compared with effects of other radiations, 9: 3007

scattering of Po, by hydrogen, 9: 1379(J)

scattering phase shift calculation for α-γ scattering by ILLIAC computer, 9: 1395(J)

stopping by water films and water vapor, 9: 3311(J)

Alpha sources

apparatus giving α-particle microbeam for irradiation of living cells, 9: 2397(J)

catalog of, 9: 246(J)

Aluminum

absorption of β particles in, and relation to surface counting for diffusion measurements, 9: 4000(J)

absorption of monoergic electrons in, 9: 791(J)

adsorption of O_2 on evaporated films of, 9: 2159(J)

angular distribution and cross sections for scattered neutrons, 9: 3993(R)

anodic film formation, theory, 9: 1194(J)

attenuation of broad beam 70 to 250 kvp x radiation by, 9: 2046(J)

bonding to itself and to cotton and glass fabric plastic laminates, effects of temperature on, 9: 651

cathodic sputtering, electron microscope study, 9: 2743(J)

charge equilibrium ratios for H ions from proton bombarded, 9: 3486(J)

chemical analysis, review, 9: 4200(J)

choice and construction of monolithic linings for twin-bath induction furnaces for melting, 9: 3195(J)

colorimetric determination of, in Florida leached zone material, 9: 880

combustion at subatmospheric pressures in O_2 and in air, equipment for, 9: 3498(R)

complexometric titration, 9: 4078(J)

Aluminum (cont'd)
compressibility parameters and Grüneisen's constants, 9: 1863
continuous flash annealing, 9: 1891(J)
control of quality in heat treatment and final operations in production of rolled, extruded, and drawn, 9: 3193(J)
corrosion, development of coating and pretreatment for inhibition of, 9: 947(R)
corrosion by hydraulic fluids, 9: 2795(R)
corrosion by wet and dry Cl_2 between 260 and 300°, 9: 158(J)
corrosion of, and stainless steel–Al couples by water, inhibition with Na dichromate-chloramine mixture, 9: 153
corrosion pits and metallic inclusions in, detection of, by colorimetric spot tests, 9: 1196
corrosion testing, methods for cleaning exposed specimens for, 9: 952(J)
creep of, at high temperatures, activation energy for, 9: 2733
creep of, during neutron irradiation, 9: 1120(J)
creep of, effects of structure on, at high temperatures, 9: 2732
cross sections for neutron transmission and multiplication, 9: 3646(J)
determination of small amounts in steel by spectrochemical method, 9: 2171(J)
distribution of products of heavy ion reactions with, 9: 3305(J)
effects of cold deformation on Young's modulus of, 9: 2769(J)
effects of cold-working and cold-working and annealing on corrosion by water of high-purity, at high temperatures, 9: 2252
effects of H on, 9: 1272(J)
electrochemical corrosion, theory, 9: 3825
electrode potentials, corrosion, electrochemical behavior, and dissolution of, in various solutions, 9: 4143(J)
electroforming Cu on inside of funnels of, 9: 3495
electrolytic polishing, 9: 4189(J)
electron emission from, bombarded by hydrogen ions, 9: 250(J)
emission of secondary electrons (δ rays) by 1.3-Mev electron bombardment, 9: 1306(J)
energy loss of secondary electrons in a cavity with walls of, 9: 2045(J)
exaggerated grain growth of extruded, 9: 1545
external bremsstrahlung emitted from P^{32} β rays stopped in, 9: 2505(J)
extrusion techniques for, bibliography, 9: 3482
gamma penetration, tables and graphs, 9: 2472
influence of substructure on slip when subjected to fatigue stresses, 9: 2371(J)
intercrystalline grains in, growth of, determined by the method of microhardness, 9: 642(J)
intergranular corrosion of, by hydrochloric acid, effects of heat treatment, iron content, and acid composition, 9: 2706
intergranular corrosion of high-purity, by hydrochloric acid, grain-boundary segregation of impurity atoms in, 9: 3826
lattice constants, 9: 3408
μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)
metabolism of, as a substitute for B, by plants, 9: 3(R)
metallurgy, research and technical progress in U.K. and U.S.A. 1954, on, 9: 2775(J)
neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)
nucleon total scattering cross sections, 9: 3673(J)
nuclear electric quadrupole interactions in, 9: 3189(J)
number of vacancies and energy of vacancy formation in, 9: 3525(J)
photonuclear reactions, 9: 2449(J)
pitting corrosion, use of radioactive tracers in, 9: 2257(J)
polarization, corrosion, and erosion-corrosion in fuming nitric acid from room temperature to 160°F, design and performance of equipment for testing, 9: 2255(J)
polishing of, with alumina abrasives, technique, 9: 3879(J)
powder metallurgy, 9: 2716(R), 4163(R), 4164(R), 4165(R)
pressure-compression data for, from shock wave measurements, 9: 3876(J)
production of μ meson pairs by 345-Mev bremsstrahlung, 9: 1336(J)
proton reactions (p,n), angular distributions and yields at 23 Mev, 9: 4290(J)
proton total cross sections at 208 and 315 Mev, 9: 358(J)
radiation measurements on oxy-aluminum flame at elevated pressures, equipment for, 9: 3498(R)
radiographic inspection, evaluation of Polaroid process for, 9: 143
radiography with Tm^{170}, 9: 2241(J)
range-velocity relation for fission fragments, 9: 1365(J)
scattering of molecules from surface of, 9: 650
scattering of 0.6, 1.0, and 1.7 Mev electrons from, 9: 2485(J)
soldering and corrosion of soldered joints in 95°C, low-conductivity, aerated, distilled water, 9: 2725
solubility in liquid Al–Si, 9: 1871(J)
solubility of, in molten AlI_3, 9: 3052
spectrographic determination in Ti and Ti alloys, 9: 639(R)
spot welding of, without slope control and regulator, 9: 219(J)
stress relaxation, 9: 3192(J)
stress values of, chart and nomograph for, 9: 3441(J)
sub-grain formation in, deformed at −183°C, 9: 3190(J)
substructure of fine-grained, x-ray study of, 9: 1208(J)
super-purity, production, properties and applications, 9: 2774(J)
tensile and creep testing, 9: 3865(R)
tensile-creep testing at high temperatures, 9: 3163
tensile strength and corrosion by water of soldered joints, 9: 193(J)
tertiary stage of creep of, 9: 202(J)
three-quantum annihilation of positrons in, 9: 249(J)
ultrasonic tinning and soldering, 9: 193(J)
volumetric determination of, with EDTA using hematoxylin as indicator, 9: 3403(J)
welding of, for H_2O_2 service, 9: 3512
welding of, survey and bibliography, 9: 1851(R)
welding of sheets of by oxy-acetylene process, 9: 221(J)

Aluminum (clad)
heat treatment in molten $NaNO_3$ without staining, 9: 1891(J)

Aluminum (liquid)
corrosive effects on steel, inhibition with Al oxide coatings, 9: 191
explosions with water, prevention of, 9: 1743

Aluminum alloys
containing Mn, Cu, Mg, Zn, Fe, Cr, Ni, Ca, Ti, Pb, or Si, spectrographic analysis, 9: 3513
continuous flash annealing, 9: 1891(J)
control of quality in heat treatment and final operations in production of rolled, extruded, and drawn, 9: 3193(J)
corrosion of heat exchangers, exposed to various inorganic and organic materials, 9: 950(J)
corrosion of 38-0 and 52S-0, by alternate exposure to liquid and gaseous fluorine, 9: 4142
corrosion testing, methods for cleaning exposed specimens for, 9: 952

Aluminum alloys (cont'd)

coupled to Ti and Zr, galvanic corrosion of, in H_2SO_4 solutions, 9: 3151(J)

creep-rupture properties of 6061-T6, at 450 and 500°F, 9: 1854

curved-crystal x-ray spectrometric microdeterminations of Fe and Mn in, 9: 3435(J)

effects of neutron flux on mechanical properties, 9: 799

effects of stress in bending and torsion fatigue tests of 25S-T6, 9: 1846

effects of temperature and unstable microstructure on mechanical properties, 9: 3510

electrolytic polishing, 9: 4189(J)

fatigue, effects of microstructure and anisotropy on, 9: 3171

fatigue and tensile properties, anisotropy of, in bending and in torsion, 9: 4158

fatigue behavior of, effects of notch size on, 9: 173

fatigue phenomena in high-strength, 9: 2322(J)

fatigue strength of, 9: 214(J)

fatigue strength of, effects of elevated temperature on, 9: 3846(R), 3855(R)

fatigue under ranges of stress, 9: 4157, 4159

influence of substructure of on slip when subjected to fatigue stresses, 9: 2371(J)

mechanical properties, effects of high heating rate on, 9: 3511

neutron-activation analysis of, for Na, 9: 1204(J)

oxide coatings on, effects on properties, 9: 3519

photometric determination of zirconium in, 9: 3545(J)

polarization, corrosion, and erosion-corrosion in fuming nitric acid from room temperature to 160°F, design and performance of equipment for testing, 9: 2255(J)

powder metallurgy, 9: 3846(R)

single-phase resistance spot welding of 3SH14, 52SH34, 61ST6, and 24ST3, schedules and equipment for, 9: 2313(J)

sintered, effects of elevated temperature on fatigue strength of, 9: 3164

solubility in liquid Al–Si, 9: 1871(J)

spot welding of thin, 9: 219(J)

surface polishing of, 9: 173

tensile properties, 9: 3521

welding of, by semiautomatic inert-gas metal-arc process, 9: 3508

welding of, survey and bibliography, 9: 1851

welding of 75S, multi-arc process for, 9: 3167

Aluminum alloys (Al clad)

fatigue tests of seam-welded, 9: 3500

Aluminum alloys (clad)

bonding to itself and to cotton and glass fabric plastic laminates, effects of temperature on, 9: 651

creep properties of, under intermittent stressing and heating conditions, 9: 3521

heat treatment in molten $NaNO_3$ without staining, 9: 1891(J)

Aluminum–aluminum oxide–nickel systems

microstructure, density, ductility, and stress-rupture, 9: 4166(R)

Aluminum–aluminum oxide systems

mass spectrographic study of gaseous species in, 9: 2842(J)

Aluminum–beryllium alloys

alloying effect of Be on properties of, 9: 982(J)

Aluminum–beryllium–iron compounds (intermetallic)

crystal structure, 9: 2310(J)

Aluminum bromides

viscosity and electrical conductivity relationship in solutions of, 9: 1748(J)

Aluminum bronze

(See also Aluminum–copper alloys.)

corrosion by chlorinated and alkalized boiler water and pure deionized water, 9: 3168

stress corrosion of cylinder valves of, 9: 3149(J)

Aluminum–carbon–titanium systems

mechanical properties, 9: 3854(R)

Aluminum–carbon–titanium–vanadium systems

tensile properties, 9: 3853(R)

Aluminum chloride–lithium chloride systems (liquid)

electric conductivity, 9: 2613

Aluminum chloride–potassium chloride systems (liquid)

electric conductivity, 9: 2613

Aluminum chloride–rubidium chloride systems (liquid)

electric conductivity, 9: 2613

Aluminum chloride–sodium bromide systems (liquid)

electric conductivity, 9: 2613

Aluminum chloride–sodium chloride systems (liquid)

chemical reactions, constitution diagrams, self-diffusion, and electric conductivity, 9: 2613

Aluminum chlorides

purification, 9: 2613

Aluminum–chromium–manganese compounds (intermetallic)

crystal structure, 9: 2373(J)

Aluminum–chromium–molybdenum–titanium alloys

phase structures and tensile properties of as-produced, 9: 2279(R)

Aluminum–chromium–nickel–titanium alloys

surface chemistry of oxidized, 9: 2747(J)

Aluminum–chromium–titanium alloys

effects of heat treatment on elevated-temperature tensile properties and microstructure, 9: 2719(R)

fabrication, 9: 1534

fabrication and physical properties, 9: 2717(R)

hardness, crystal structure, and phase studies, 9: 3520

hardness, heat treatment, and microstructure, 9: 4186

impact strength and hardness of weld thermal-cycled heat-affected zone of, 9: 1531

microstructure and continuous cooling transformation of, 9: 1531

Aluminum coatings

spraying of, on iron and steel for corrosion prevention, 9: 3150(J)

on steel, corrosion and weldability of, 9: 171

Aluminum–cobalt–molybdenum alloys

oxidation at 954°C, 9: 3146

Aluminum–copper alloys

(See also Aluminum bronze.)

creep of, effects of structure on, at high temperature, 9: 2732

creep of, grain-boundary movement, slip, and fragmentation during, 9: 2321(J)

electrolytic polishing, 9: 4189(J)

intercrystalline corrosion, due to aging, 9: 4143(J)

magnetic susceptibility and change of state on tempering, 9: 4192(J)

relaxation effects in solid solutions of, arising from changes in local order, 9: 204(J)

relaxation strength, 9: 1537

Aluminum–copper couples

preparation and grain-boundary diffusion, 9: 971(R)

Aluminum–copper–magnesium alloys

aging characteristics, 9: 2323(J)

Aluminum–copper–magnesium–manganese alloys

effects of heat treatment on corrosion, 9: 4143(J)

exaggerated grain growth of extruded, 9: 1545

Aluminum–copper–nickel alloys

diffusionless phase transformation, crystal structure, heat treatment, and thermal expansion, 9: 1861(R)

Aluminum–copper–silicon systems

corrosion resistance and mechanical properties of, effects of variation of zinc content on, 9: 3541(J)

effects of vibration on solidification, 9: 3851

Aluminum–copper–zinc alloys

spiral substructures in β phase, 9: 1881(J), 1882(J)

Aluminum crystals

plastic deformation of, at elevated temperatures, 9: 3863

production, 9: 1548

recrystallization of, surface nucleation in, 9: 2370(J)

Aluminum foils

continuous annealing without crinkling, 9: 1891(J)

Aluminum hydrides

preparation of, by reaction with atomic H, 9: 635(R)

Aluminum hydroxides

preparation of, by precipitation through seeding with hydragillite, 9: 2680(J)

Aluminum–indium–titanium alloys

hardness, crystal structure, and phase studies, 9: 3520

Aluminum iodides (liquid)

solubility of Al in, 9: 3052

Aluminum ions

hydrolysis of Al^{+3}, mathematical analysis, 9: 2621(J)

Aluminum–iron alloys

thermodynamic properties, 9: 2294(R)

Aluminum–iron compounds (intermetallic)

crystal structure, 9: 2311(J)

Aluminum–iron–titanium alloys

fabrication and physical properties, 9: 2717(R)

hardness, crystal structure, and phase studies, 9: 3520

Aluminum isotopes Al^{24}

decay scheme, 9: 2997(J)

Aluminum isotopes Al^{25}

detection and decay of, 9: 1681(J)

nuclear properties, 9: 3302(J), 3303(J)

observation of 6.7-sec isomeric state, 9: 2064(J)

Aluminum isotopes Al^{27}

activation determination with α source, 9: 1650

alpha reactions (α,p), angular distribution of protons from, 9: 2913

deuteron reactions (d,d), 9: 1066(R)

deuteron reactions (d,p), 9: 2331(R)

energy levels, 9: 739(J)

gamma reactions (γ,2α2p), N^{17} yield curve from, 9: 3644

nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)

neutron reactions (n,p), 9: 798(J)

proton reactions (p,α), 9: 1359(J)

proton reactions (p,γ), energies from, 9: 3984(J)

proton reaction (p,3pn), cross section, 9: 4286

Aluminum isotopes Al^{27} (cont'd)

scattering of protons by and energy levels of, 9: 2484(J)

Aluminum–lithium–magnesium alloys

magnesium-rich corner of 100, 200, 375°C isothermal sections of, 9: 2760(J)

phase relations in, 9: 3166, 3481, 3484(R)

Aluminum–magnesium alloys

chemical analysis and creep resistance, 9: 4161(R)

compression strength properties, 9: 3865(R)

creep of, effects of structure on, at high temperature, 9: 2732

creep of, grain-boundary movement, slip, and fragmentation during, 9: 2321(J)

effects of temperature and grain size on flow and fracture strength of α solid solutions of, 9: 3172(R)

electrolytic polishing, 9: 4189(J)

foaming in crucibles, effects of ZrH_4 additions on, 9: 191

interaction of precipitation, solid-solution content, and creep in, 9: 1270

intercrystalline corrosion due to aging, 9: 4143(J)

formation of foamed metal low-density core material of, for sandwich construction, design of equipment for, 9: 3182

formation of low-density foams of, methods and equipment for, 9: 3181

sand casting of, development of inhibitors, review, 9: 3476

soft x-ray spectra, 9: 3697(J)

weld crack sensitivity in, effects of separation stresses, form of separation of intermediate phases, shrinkage cavities, and unusual shrinking stresses on, 9: 196

Aluminum–magnesium–manganese alloys

weld crack sensitivity in, effects of separation stresses, form of separation of intermediate phases, shrinkage cavities, and unusual shrinking stresses on, 9: 196

Aluminum–magnesium–silicon systems

electrolytic polishing, 9: 4189(J)

Aluminum–magnesium–zinc alloys

stress corrosion of, due to $MgZn_2$, 9: 4143(J)

Aluminum–manganese–titanium alloys

analysis of, for H, 9: 3077(J)

casting and mechanical properties of as-cast and wrought, 9: 184

compression properties and microstructure, 9: 3475

fabrication, heat treatment, phase studies, mechanical properties, microstructure, and aging characteristics, 9: 1856

hardness, crystal structure, and phase studies, 9: 3520

high-temperature tensile properties of annealed sheet and bar, 9: 3196(J)

machining and grinding, 9: 4174

mechanical properties and microstructure of flash-welded, 9: 964

phase studies and microstructure, 9: 1873(J)

transformation temperatures, age hardening heat treatment, and mechanical properties, 9: 1534

Aluminum–molybdenum compounds (intermetallic)

crystal structure, 9: 2373(J)

Aluminum–molybdenum–titanium alloys

creep and tensile properties of as-forged and heat-treated, effect of structure on, 9: 2279(R)

effects of heat treatment on elevated-temperature tensile properties and microstructure, 9: 2719(R)

hardness, crystal structure, and phase studies, 9: 3520

melting techniques and forging temperatures for preparation of, 9: 1850(

Aluminum–nickel alloys

effects of Mo, $MoCl_2$, and Li on high-temperature strength, 9: 3485

Aluminum–nickel alloys (cont'd)

microstructure, density, ductility, and stress-rupture, 9: 4166(R)

powder metallurgy and properties, 9: 3485

Aluminum–nickel–titanium alloys

hardness, crystal structure, and phase studies, 9: 3520

preparation, sintering, density, resistivity, percent O_2, stress-rupture, and impact strength of hot-pressed, 9: 3165(R)

stress-rupture of sintered, 9: 3850(R)

Aluminum–nickel–zirconium alloys

preparation, density, resistivity, stress-rupture, and transverse rupture strength of hot-pressed, 9: 3165(R)

Aluminum–niobium–titanium alloys

hardness, crystal structure, and phase studies, 9: 3520

oxidation, 9: 3849(R)

Aluminum–nitrogen–titanium systems

mechanical properties, 9: 3854(R)

Aluminum oxide–aluminum–nickel systems

microstructure, density, ductility, and stress-rupture, 9: 4166(R)

Aluminum oxide–aluminum systems

mass spectrographic study of gaseous species in, 9: 2842(J)

Aluminum oxide–calcium oxide–silicon oxide systems

electrolysis of slags of, containing S, 9: 2135(R)

Aluminum oxide–chromium compacts

vibratory compacting, 9: 4173(R)

Aluminum oxide coatings

on steel for inhibition of corrosion by molten Al, 9: 191

Aluminum oxide compacts

thermal rupture of, effects of porosity on, 9: 1507(J)

vibratory compacting, 9: 4173(R)

Aluminum oxide crucibles

preparation and properties of, for molten Ti, 9: 2246

Aluminum oxide films

as a protective coating during Al corrosion, 9: 4143(J)

Aluminum oxide systems

effects of temperature, additives, and preparation on creep and recrystallization, 9: 2731

Aluminum oxide–titanium oxide systems

thermal expansion, 9: 3844(R)

Aluminum oxide–titanium systems

hardness and microstructure, 9: 2246

powder metallurgy, 9: 3496

Aluminum oxides

electrical and mechanical properties, measurements in 3 cm wavelength region, 9: 3962

gas chromatographic elution of gases and volatile liquids from H_2, N_2, or CO_2, 9: 2672(J)

heat and free energy of formation, 9: 529(J)

properties of, effect of molten Ti on, 9: 2246

reaction of Th with, at high temperatures, 9: 1247

streaming potentials of, in solutions of HCl and NaCl, 9: 623(R)

use as an abrasive, for polishing metals, 9: 3879(J)

Aluminum–oxygen–titanium systems

effects of heat treatment on elevated-temperature tensile properties and microstructure, 9: 2719(R)

mechanical properties, 9: 3854(R)

Aluminum phosphides

preparation of, for neutron diffraction studies, 9: 3755

Aluminum powders

extrusion and surface area measurements, 9: 4163(R)

Aluminum–silicon systems

soft x-ray spectra, 9: 3697(J)

Aluminum–silicon systems (liquid)

solubility of solid Al and Al alloys in, 9: 1871(J)

Aluminum–silicon–titanium systems

effects of heat treatment on elevated-temperature tensile properties and microstructure, 9: 2719(R)

hardness, crystal structure, and phase studies, 9: 3520

melting techniques and forging temperatures for preparation of, 9: 1880(

phase studies and hardness of, 9: 1843(R)

tensile properties of as-forged, 9: 2279(R)

transformation temperatures, age hardening, heat treatment, and mechanical properties, 9: 1534

Aluminum–silicon–zinc systems

corrosion of, in 95°C, low-conductivity, aerated, distilled water, 9: 2721

Aluminum–silver alloys

age-hardening of, in thin layers, 9: 2782(J)

intercrystalline grains in, growth of determined by the method of microhardness, 9: 642(J)

thermodynamic properties and phase studies, 9: 2294(R)

thermodynamic properties and x-ray measurements of various phases of, 9: 972(R)

Aluminum–silver–titanium alloys

oxidation, 9: 3849(R)

Aluminum–stainless steel couples

polarization, corrosion, and erosion-corrosion of galvanic, in fuming nitric acid from room temperature to 160°F, design and performance of equipment for testing, 9: 2255(J)

Aluminum–tantalum–titanium alloys

hardness, crystal structure, and phase studies, 9: 3520

oxidation, 9: 3849(R)

Aluminum–thorium alloys

chemical analysis of, for Th, 9: 1759

Aluminum–thorium compounds (intermetallic)

crystal structure, 9: 3237(J)

Aluminum–tin–titanium alloys

hardness, crystal structure, and phase studies, 9: 3520

high-temperature tensile properties of annealed sheet and bar, 9: 3198(J)

spot welded joints in, 9: 1839(R)

Aluminum–tin–titanium–vanadium alloys

fabrication and physical properties, 9: 2717(R)

Aluminum–tin–zinc alloys

corrosion in 95°C, low-conductivity, aerated, distilled water, 9: 2725

Aluminum titanates

preparation and refractory properties, 9: 3844(R)

Aluminum–titanium alloys

casting and mechanical properties of as-cast and wrought, 9: 184

casting and powder metallurgy, 9: 3849(R)

creep and rupture behavior at 600 to 1000°F, 9: 3483

creep and tensile properties of as-forged, effect of structure on, 9: 2279(R)

creep deformation of, 9: 175(R)

effects of Al on occupation of lattice sites in the AlTi phase, 9: 1539

effects of heat treatment on elevated-temperature tensile properties and microstructure, 9: 2719(R)

Aluminum–titanium alloys (cont'd)

fabrication, heat treatment, and effect of microstructure on mechanical properties of, 9: 178

fabrication, mechanical properties, oxidation, and powder metallurgy, 9: 3520

hot-rolled textures and deformation mechanisms of, 9: 1836(R)

hydrogen equilibrium pressure and concentration in α-phase, 9: 2329(J)

mechanical properties and microstructure of flash-welded, 9: 965

mechanical properties of, effects of structure and composition on, 9: 201(J)

melting techniques and forging temperatures for preparation of, 9: 1850(R)

metallurgical properties, 9: 3475

microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296

nature of quench transformation in, 9: 1844(R)

phase studies, bend ductility, tensile properties, hardness, and microstructures of as-rolled and heat-treated welded and unwelded, 9: 3493(R)

preparation by nonconsumable and consumable electrode arc melting, 9: 2293(R)

room-temperature dynamic elastic modulus and its ratio to density, 9: 2728(R)

strength, effects of temperature, 9: 2282

tensile, bend, and hardness properties of as-rolled and heat-treated welded and unwelded, 9: 3499(R)

tensile properties at room-temperature, effects of creep tests conditions on, 9: 2275(R)

welding and mechanical properties, effect of alloying elements on, 9: 3854(R)

Aluminum–titanium compounds (intermetallic)

preparation of homogenous γ, 9: 3850(R)

Aluminum–titanium–vanadium alloys

aging characteristics and tensile, bend, and hardness properties of as-rolled and heat treated welded and unwelded, 9: 3499(R)

effects of heat treatment on elevated-temperature tensile properties and microstructure, 9: 2719(R)

electroplating and tensile properties, 9: 3853(R)

fabrication, heat treatment, and effect of section size on mechanical properties, 9: 1534

hardness, crystal structure, and phase studies, 9: 3520

hardness of, water quenched from 1000°C, 9: 1842(R)

melting techniques and forging temperatures for preparation of, 9: 1850(R)

partial isothermal sections of, at 800, 900, 1000, and 1200°, 9: 1843(R)

phase studies, 9: 1844(R)

Aluminum–titanium–zirconium alloys

hardness, crystal structure, and phase studies, 9: 3520

impact testing, presintering and sintering and stress-rupture testing of sintered, 9: 3850(R)

Aluminum–tungsten compounds (intermetallic)

crystal structure, 9: 2373(J)

Aluminum–zinc alloys

corrosion in 95°C, low-conductivity, aerated, distilled water, 9: 2725

creep of, grain-boundary movement, slip, and fragmentation during, 9: 2321(J)

intercrystalline grains in, growth of, determined by the method of microhardness, 9: 642(J)

thermodynamic properties, 9: 972(R)

Aluminum–zirconium alloys

creep-rupture, 9: 190(R)

creep-rupture at elevated temperatures, 9: 2727(R)

Aluminum–zirconium compounds (intermetallic)

crystal structure and properties of, 9: 2762(J)

American Electro Metal Corp.

progress reports on cemented borides, 9: 150(R)

progress reports on effect of raw material production variables on properties of carbides, nitrides, and borides, 9: 2703(R)

progress reports on investigation and evaluation of new high-temperature materials, 9: 3841(R)

progress reports on investigation of intermetallic compounds of Al, 9: 3165(R), 3850

American Lava Corp.

progress reports on ceramic-to-metal seals, 9: 4138(R)

American Meat Inst. Foundation

progress reports on utilization of gross fission, 9: 10(R)

Americium

(See also Actinides; Transplutonic elements; Transuranic elements.)

chelation with thenoyltrifluoroacetone, 9: 924(J)

vapor pressure, 9: 3081(J)

Americium(III) fluorides

heats and free energies of sublimation and vapor pressure of, at elevated temperatures, 9: 3800(J)

Americium(III) ions

isotopic exchange reactions of, with Am(V), 9: 4112(J)

oxidation to Am^{+4}, 9: 1230(J)

Americium(V) ions

isotopic exchange reactions of, with Am(III) and Am(VI), 9: 4112(J)

Americium(VI) ions

isotopic exchange reactions of, with Am(V), 9: 4112(J)

preparation by oxidation of Am^{+3}, 9: 1230(J)

Americium isotopes Am^{241}

decay scheme from spectral studies in α decay, 9: 2063(J)

gamma and x-ray spectra, 9: 2967(J)

Ames Lab.

progress reports in physics, 9: 1994(R)

Amine complexes

of Co, H_2 high-temperature, high-pressure reduction, design and performance of equipment for, 9: 1181

Amines

(For derivatives see by name of substituent, e.g., Dodecylamine acetate.)

reactions with BF_3, 9: 2624(J)

Amino acids

acetylation of, by ethyl thioltrifluoroacetate in aqueous solution, 9: 123

of blood serum lipoproteins, chromatographic determinations, 9: 3071

incorporation by Trichinella larvae, tracer study, 9: 2099(R)

radioinduced erythema inhibition with, 9: 2602(J)

spectrophotometric analysis of, in blood serum, 9: 3778

Ammonia

alpha-induced decomposition of, variation in source intensity on, 9: 3425(J)

crystalline, Raman spectrum at −82°C, 9: 888(J)

molecular structure, theory, 9: 231(R)

Raman spectra of 3-D labeled, at −82°C, 9: 888(J)

reactions with BF_3, 9: 2624(J)

solid γ-irradiated, paramagnetic spectra, 9: 3423(J)

Ammonia (liquid)

cleaning of residual Na from loops with, 9: 4179(R)

decomposition of tetraalkylammonium amides and tetraethylammonium by, 9: 2218(J)

Ammonia (liquid) (cont'd)

potentiometric titrations in, using a difference indicator electrode system, 9: 1206(J)

reaction with BF_3 and BI_3, 9: 515

thermoelectric power of alkali metals in, 9: 1911(J)

Ammonia–boron fluoride systems

preparation, properties, and reaction mechanisms, 9: 515

Ammonia–helium systems

mutual solubility of gases at high temperatures in, 9: 3239(J)

Ammonium borohydrides, tetraalkyl-

melting points, preparations, and solubilities in various solvents, 9: 2131

Ammonium bromides

radiation chemistry, 9: 900(J)

titration of, with K and K amide in liquid ammonia using difference indicator electrode system, 9: 1206(J)

Ammonium compounds, quaternary

of fluoride and bromide, melting points, preparations, and solubilities in various solvents, 9: 2131

preparation and chemical reactions of alkali metal ammonium and tetraalkylammonium fluoborates, 9: 2679

radiation decomposition of, 9: 102

synthesis and decomposition in liquid ammonia, 9: 2218(J)

Ammonium iron(II) sulfates

energy absorption and ionization calculations for Co^{60} and betatron irradiation of solutions of, 9: 2201(J)

Ammonium nitrates

explosive decomposition of, causes, 9: 66

Ammonium phosphates

x-ray-diffraction analysis data, 9: 1945

Ammonium zirconium fluorides

crystal structure, 9: 2227(J)

Amoeba

cell division in, effects of x irradiation on, 9: 2112(J)

Amplifiers

(See also Electron tubes.)

automatic zeroing circuit for d-c, 9: 4226

circuits with input impedance for, 9: 274

design and performance of linear, for use with scintillation detectors, 9: 3913

design of, for use with servomechanisms, 9: 4229

design of d-c, for neutron survey equipment, 9: 3250

design of variable capacitance, 9: 1438(P)

difference, for HRE simulator, circuit for, 9: 371

fast response, for scintillation detectors, 9: 3941(J)

mixing pre-, circuits for, 9: 281(J)

pulse, circuit changes to improve the linearity of the voltage output, 9: 1027(J)

pulse, effect of feedback on noise in, 9: 1586

for reactor control, development of, 9: 1308

signal noise and resolution for nuclear counters, 9: 1319(J)

single loop, design, 9: 1582

small current d-c, for photocells and ion chambers, 9: 1951(J)

Amphibians

metamorphosis of axolotls, effects of age, coloring, and sex, 9: 471(J)

Analgesics

(See also Anesthetics.)

pharmacological effects of, effects of radiation on, in rats, 9: 13

Analysis

(See appropriate subheadings under specific materials; see also specific methods, e.g., Chromatographic analysis; Isotopic equilibration analysis; Radiometric analysis.)

Anesthetics

(See also Analgesics.)

pharmacodynamic properties of the chlorohydrate of chloro-3(dimethylamino-3' propyl)-10-phenothiazine, 9: 3045(J)

Animal cells

mast cells, morphology of heparin storage and elimination, 9: 1706(J)

morphology of, in malpighian tubules, in grasshoppers, 9: 3(R)

radiosensitivity, factors affecting, 9: 3015(J)

somatic, factors affecting radiosensitivity, 9: 821(J)

Animal metabolism

effects of irradiation on steroidogenesis in isolated calf adrenals, 9: 1165(J)

Anion exchange materials

adsorption of acids by polyvalent forms of, 9: 2212(J)

selectivities of, by osmotic behavior, 9: 3100(J)

titration studies, 9: 872(J)

Anions

beam production and measurement of scattering, apparatus for, 9: 2471

electroreduction of, theory, 9: 856(J)

Annealing

(See also appropriate subheadings under specific materials.)

techniques and experiments with cold-worked metals, 9: 980(J)

Annie Creek Area (S. Dak.)

occurrence of autunite in, 9: 165(J)

Annie Laurie Prospect (Ariz.)

uranium distribution in Ruby quadrangle, 9: 161

Anoxia

effects of, on radiosensitivity of hematopoietic cells of tadpoles, 9: 1448(J)

tolerance to, effects of total-body x irradiation on, in guinea pigs, 9: 2110

Anthracene

scintillation response of, at low particle energies, 9: 707(J)

Anthranilic acid

uses in volumetric estimation of Th, 9: 2642(J)

Anthranilic acid, 3-hydroxy-

conversion into N^1-methylnicotinamide in rats, tracer study, 9: 124(J)

Anthranilic acid, 5-iodo-

uses in gravimetric estimation of Th and its separation from cerite earths, 9: 2642(J)

Anti-size compounds

(See Lubricants.)

Antibodies

labeled with I^{131}, preparation and localization in tumors, 9: 3748(R)

Antimony

absorption of cosmic μ mesons, 9: 721

anion exchange separation, 9: 3109(J)

determination in cathode materials, 9: 1893(R)

μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)

proton stopping cross section, 9: 2026

radiochemical determination, 9: 876

separation and determination of, by electrochemical means, 9: 87(J)

spectrographic determination in Bi, 9: 1475

Antimony (cont'd)
spectrographic determination of, in ores and rocks, 9: 162
vapor pressure, 9: 1188(J)
Antimony bromides
viscosity and electrical conductivity relationship in solutions of, 9: 1748(J)
Antimony deuterides
microwave spectra in shorter mm region, 9: 2986(J)
Antimony fluorides
electrical conductivity, 9: 3415(J)
Antimony–germanium alloys
phase studies, 9: 3184(J)
Antimony hydrides
microwave spectra and molecular structure of SbH_3 and SbD_3, 9: 1134(R)
microwave spectra in shorter mm region, 9: 2986(J)
Antimony isotopes
nuclear couplings and quadrupole moments, 9: 2986(J)
Antimony isotopes Sb^{116}
positron energy and γ intensity from isomers of, 9: 447(J)
Antimony isotopes Sb^{117}
decay schemes, 9: 2056(J)
Antimony isotopes Sb^{121}
nuclear quadrupole coupling and moments, 9: 1134(R)
Antimony isotopes Sb^{122}
beta spectra and decay scheme, 9: 1127(J)
decay of 3.5-min metastable state, 9: 4322(J)
Antimony isotopes Sb^{123}
nuclear quadrupole coupling and moments, 9: 1134(R)
Antimony isotopes Sb^{124}
beta spectra, 9: 440(J), 3969(J)
decay scheme, 9: 1067(R)
gamma emission, absolute no. of quanta in, 9: 1972(J)
use in measuring vapor pressure of Sb, 9: 1188(J)
Antimony oxides
heat and free energy of formation, 9: 529(J)
Antioxidants
high-temperature, for synthetic base oils, evaluation, 9: 4115(R)
Apatites
exchange of Ra and Ca in, 9: 847
Archeological specimens
age determinations of, by C^{14} dating, equipment, 9: 3255(J)
age determinations of, by radiocarbon dating, 9: 1286(J), 2347(J)
Arden Area (Nev.)
uranium distribution, 9: 1260(J)
Argentina (Mendoza Province)
occurrence of Schroeckingerite in, 9: 958(J)
Argon
adsorption on rutile, 9: 3113(J)
alpha particle ionization in, with added impurities, 9: 780(J)
continuous detection and measurement of low concentrations of O_2 by dew-point method, 9: 2636(J)
drift velocity of electrons in, 9: 2539(R)
effects on oscillations in halogen-quenched G-M counters, 9: 309(J)
energy loss of positive ions single scattered in, 9: 1377(J)
equation of state, 9: 265(J)
heats of adsorption of, on carbon blacks graphitized at successively higher temperatures, 9: 2677
ion pair formation, 9: 4039(R)
Argon (cont'd)
ionic species formed by collision of gaseous ions in, 9: 1378(J)
ionization by α particles and fission fragments, 9: 2821
isotope abundances in certain minerals, 9: 4234(R)
purification by hot metals, 9: 2382
purity, apparatus for testing, 9: 3776
solidified, compressibilities at low temperature, 9: 2824(J)
variation in isotopic abundance of, extracted from radioactive minerals, 9: 626(J)
Argon–ethylene systems
viscosity of, at 25°C, 9: 3213
Argon ions
energy loss in gases of positive single scattered, 9: 1377(J)
ionic species formed in gases by collision with, 9: 1378(J)
Argon isotopes A^{36}
radioactivity, 9: 3965(R)
Argon isotopes A^{37}
electron capture in, orbital electron excitation associated with, 9: 1682(J)
K capture, 9: 1044(J)
neutrino emission, 9: 1067(R)
neutrino emission, observation with magnetic and electric deflection spectrometry, 9: 2078(J)
Argon isotopes A^{39}
mass, determination of best value, 9: 3283(J)
Argon isotopes A^{40}
formation of, from decay of K^{40} in dating of archeological specimens, 9: 3463(J)
neutron activation determination of, to determine age of K minerals, 9: 2713(J)
ratio to K^{40} in meteorites, age determination by, 9: 1915(J)
scattering of 9.5-Mev protons, 9: 1390(J)
Argon–nitrogen systems
filling of ion chambers with, advantages, 9: 3949(J)
Argonne Cancer Research Hospital
progress reports, 9: 3748(R)
Argonne National Lab.
manual of special materials analytical laboratory procedures, 9: 4074
meteorology, 9: 340
progress reports of Physics Div., 9: 988(R)
progress reports on biological and medical research, 9: 3(R)
progress reports on radiological physics and biological and medical research, 9: 2538(R)
Argonne Research Reactor
design, 9: 3293(J)
Arizona
index map showing location of Painted Desert Area in Coconino and Navajo counties, 9: 2268(J)
mineral association in U deposits, 9: 1829
trace elements reconnaissance in Black Mesa Area in Coconino and Navajo counties, 9: 2709
Arizona (Apache Co.)
exploration of the Defiance Uplift in, 9: 1828
trace elements reconnaissance in Chuska Mountains Area in, 9: 2709
Arizona (Santa Cruz Co.)
exploration of Ruby Quandrangle in, 9: 161
Arkansas Univ. Coll. of Arts and Sciences
progress reports on chemical effects of nuclear transformations, 9: 4101(R)

Arkansas Univ. Engineering Experiment Station

progress reports on development of a mass spectrometer, 9: 3918(R)

progress reports on development of an instrument for the instantaneous analysis of gas mixtures, 9: 1578(R), 1579(R)

Armour Research Foundation

progress reports on a study of a family of Laves-type intermediate phases, 9: 2721(R)

progress reports on development of Ti-base alloys of high strength and toughness, 9: 1534(R)

progress reports on development of transformation data for special Ti alloys, 9: 180(R)

progress reports on effects of alloying elements on weldability Ti and Ti alloys, 9: 3854(R), 3493(R)

progress reports on evaluation of high-strength weldable Ti-base alloys, 9: 3499(R)

progress reports on exploration of vanadium-base alloys, 9: 3516(R), 3517(R), 3853(R)

progress reports on increasing ratio of modulus of elasticity to density of Ti alloys, 9: 2293(R), 2728(R)

progress reports on mechanisms of heat treatment of Zr-base alloy, 9: 1530(R)

progress reports on metallurgical characteristics of Al–Ti-base alloy, 9: 3475, 3849(R)

progress reports on phase relationships and transformation processes of Ti alloys, 9: 1841(R), 1842(R), 1843(R), 1844(R)

progress reports on phase relationships in Al–Li–Mg alloys, 9: 3484(R)

progress reports on radiation sensitive glasses, 9: 2945(R)

progress reports on structural changes of Ti alloys, 9: 3486(R)

progress reports on surface hardening of Ti with metalloid elements, 9: 978(R)

progress reports on titanium alloys for elevated temperature application, 9: 1845(R), 1850(R), 2719(R)

Aromatic compounds

polynuclear, physical properties, lubricity, and synthesis, 9: 4108(R)

Arsenic

bremsstrahlung reactions at 320 Mev, interpretation of results, 9: 3654(J)

bremsstrahlung reactions at 320 Mev, nuclide yields from, 9: 3653(J)

radiochemical determination, 9: 876

tissue reactions following injection of, in rats and rabbits, 9: 505(J)

vaporization, 9: 2823(J)

Arsenic deuterides

microwave spectra in 1- to 3-mm wave region, 9: 2987(J)

Arsenic hydrides

microwave spectra in 1- to 3-mm wave region, 9: 2987(J)

Arsenic isotopes As^{69}

determination and identification, 9: 3917(J)

Arsenic isotopes As^{70}

gamma-ray spectrum, 9: 3917(J)

Arsenic isotopes As^{71}

disintegration, 9: 1412(J), 3340(J)

Arsenic isotopes As^{75}

nuclear quadrupole coupling and moments, 9: 1134(R)

nuclear quadrupole resonances of, in trihalides and the triphenyl, 9: 2900(J)

Arsenic isotopes As^{76}

beta spectrum, 9: 1994(R)

gamma emission of, 9: 807(J)

Arsenic isotopes As^{77}

gamma spectra accompanying decay of, 9: 3694(J)

Arsenic oxides

heat and free energy of formation, 9: 529(J)

Arsine

microwave spectra and molecular structure of AsH_3 and AsD_3, 9: 1134(R)

Arsonium compounds

use in colorimetric determination of Co in alloy steels, 9: 2162

Asbestos

tissue reactions following injection of, in rats and rabbits, 9: 505(J)

Ascorbic acid

luminescence of, under high-energy γ irradiation before and after 50-kv x irradiation, 9: 1783

Astatine

effects of thyroxine and KSCN on accumulation of, by thyroid gland, 9: 1709(J)

reactions of, with protein, 9: 2099(R)

thyroidal accumulation of, effects of propylthiouracil and thyroxine treatment in rats, tracer study, 9: 3730(R)

Astatine isotopes

alpha decay in, relation to shell model, 9: 1999(J)

Astatine isotopes At^{211}

pathological effects of, on monkeys and rats, 9: 2551(R), 3730(R)

radiometric determination of, in the presence of I^{127} and I^{131} in excised thyroid tissue, 9: 1477

thyroidal accumulation, effect of thiouracil treatment on, in rats, 9: 4039(R)

uptake by thyroid gland, dietary factors, 9: 2099(R)

Astatine isotopes At^{217}

radioactivity and energy levels, 9: 2500

Astrophysics

acceleration of charged particles to cosmic ray energies by electromagnetic induction in galaxies, 9: 673(J)

cosmic abundances of K, U, and Th and heat balances of the earth, the moon, and Mars, 9: 3065(J)

production of Tc^{99} in stars, 9: 1914(J)

Atascosa Formation (Ariz.)

geology of, 9: 161

Atkinson Creek Quadrangle (Colo.)

geologic map of, for mineral investigations field studies, 9: 1525(J)

Atlanta Mine (Nev.)

exploration and U distribution, 9: 1260(J)

Atlantic Ocean Beach

geophysical exploration of, of Florida, Georgia, North Carolina and Virginia, 9: 3828

Atmosphere

(See also Air; Meteorology; Stack disposal.)

β-ray ionization from ground, 9: 3153

in different parts of the world, corrosive effects on metals and alloys, 9: 3824

formation and relative abundance of HT and HTO in, 9: 126(J)

isotopic content of O_2 and N_2 in, 9: 662(J)

radioactivity after atomic explosions, in France, 9: 2536(J)

radiological monitoring, 9: 1045(J)

radiological monitoring of, multichannel telemetering system for, 9: 1966

turbulence study at Brookhaven Lab., 9: 341

Atmospheres

(See also subheadings under equipment using special atmospheres.)

argon dry box, apparatus for testing, 9: 3776

Atomic clouds

formed by fission product release from stacks, dosage calculations, 9: 2700

Atomic clouds (cont'd)
nomographs for calculating radiation hazards, 9: 36(J)
Atomic energy
(See also Nuclear power.)
physical foundations and applications, book, 9: 4036(J)
review of Canadian program on, 9: 4037
survey of, 9: 1152(J)
Atomic Energy Commission
semiannual report for July–Dec. 1954, 9: 2537(J)
Atomic explosions
chorioretinal burns produced by flash, 9: 3026(J)
design of an elevated tank to withstand, 9: 2101(J)
direction indicator for, 9: 1437(P)
effects of, on elevated tanks and standpipes, 9: 659
injuries from, on residents of Nagasaki and Hiroshima, summary, 9: 3745(J)
mechanical injuries, radiation injuries, and flash burns from, effects of distance on, among survivors in Hiroshima, 9: 3366(J)
meteorological effects, 9: 1990(J)
nomographs for calculating radiation hazards, 9: 36(J)
radiation hazards from, effects of environment, 9: 2590
radiations from, late pathological effects of, on mice, 9: 21(J)
safety and lethal effects, 9: 469(J)
statistical analysis of the medical effects of, on residents of Hiroshima and Nagasaki, 9: 2535
Atomic masses
empirical equation for, 9: 2916(J)
mass spectroscopic determination of mass differences, 9: 730(J)
microwave determination, 9: 729(J)
Atomic models
equation of state of air by Thomas-Fermi, 9: 3211
temperature-perturbed Thomas-Fermi equation, solutions to, 9: 2990
Atomic power
(See Nuclear power.)
Atomic structure
electron energy levels for Thomas-Fermi and Thomas-Fermi-Dirac potential, 9: 2989
relationship of electronic density and electric potential, 9: 465(J)
tables of two-center Coulomb integrals between 1s, 2s, and 2p orbitals, 9: 4239
Atoms
approximate analytic solution of the Thomas-Fermi equation for, 9: 2098(J)
electronic levels of, adsorbed on surface of a crystal, 9: 1930(J)
mass difference determination by mass spectroscopy, 9: 730(J)
mass of, and their nuclear energy bonds, review, 9: 744(J)
simple analytic wave functions for configurations $(1s)^2(2s)$ and $(1s)^2(2s)^2$ in, from He to C, 9: 4339(J)
statistical potential and electron density distributions for, tables, 9: 69(J)
time varying optical absorption of, method of measuring, 9: 2348(J)
Atropine
biosynthesis of C^{14}-labeled, 9: 2105(J)
Aurintricarboxylic acid
in therapy of Be poisoning, 9: 3(R)
Austin Area (Nev.)
exploration and U distribution in, 9: 1257
Autopsies
on radioactive cadavers, safety, 9: 44(J)
Autoradiography
(See Radioautography.)
Auxins
biosynthesis of, by plants, 9: 3(R)
Aviation personnel
hazards from cosmic radiation for, 9: 34(J)
8-Azaguanine
effects on incorporation of adenine into nucleic acids in mice, 9: 1449(J)
Azobenzene, dimethylamino-
effects of radiation on, 9: 3888(R), 3889(R)
Azomethane, hexafluoro-
direct fluorination, 9: 890

B

Baca Formation (N. Mex.)
geology and exploration of, 9: 955(J)
Bacteremia
effects of, on survival of irradiated rats, 9: 2546
following total-body irradiation in mice, 9: 2553(J)
induced by total-body irradiation, in burros, 9: 1156(R)
induced by total-body x irradiation in rats, 9: 2115(J)
Bacteria
(See also by species.)
aerosols containing, effect of particle size on bacterial viability, 9: 4041
associated with stored meat spoilage, identification and radiosensitivity of, 9: 10(R)
carbon dioxide metabolism by Rhodopseudomonas capsulatus, 9: 61(R)
effects of radiation on survival of Cl. botulinum spores and toxins produced by Cl. botulinum and staphlococci, 9: 474
fixation of CO_2 by Rhodopseudomonas capsulatus, 9: 506
germ-free rats, effects of radiation, 9: 2546
oxygen effect in x-irradiated, role of respiration and cellular metabolism in, 9: 24(J)
radiosensitivity of Clostridium botulinum, 9: 11
radiosensitivity of, effects of food processing conditions on, 9: 1715(J)
radiosensitivity of, influence of pretreatments and posttreatments, 9: 3743(J)
response of Bacillus megaterium to latent period of infecting virus, thermal, x-ray, and deuteron inactivation, 9: 1153(J)
spores of, resistance to γ irradiation, 9: 33(J)
Bacteriophages
inactivation of, by β particles from incorporated P^{32}, 9: 3367(J)
latent period of, effects of radiation, 9: 1160(J)
properties of, effects of three bacterial hosts on, 9: 1153(J)
radioinduced latent period, 9: 2570(J)
Balances
analytical, testing and inspection, 9: 4074
micro-, design, 9: 4230
Bald Mountain Mining District (S. Dak.)
geology, mineralogy, and U distribution, 9: 165(J)
Barium
chromatographic separation on cellulose powder, 9: 4105(J)
K absorption frequency, 9: 3698(J)
neutron resonances, 9: 1073(J)
μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)
radiochemical determination, 9: 876

Barium aluminate–rhenium compacts

electronic properties, 9: 2722(R)

fabrication of cathodes, 9: 976

Barium carbonate–rhenium electrodes

performance, 9: 976

Barium carbonate–rhenium–strontium carbonate compacts

fabrication of cathodes, 9: 976

Barium chlorides

concentration of O^{18} in water of crystallization, 9: 2267(J)

Barium isotopes Ba^{128}

decay scheme, 9: 803(J)

Barium isotopes Ba^{129}

decay scheme of Ba^{129}–Cs^{129} chain, 9: 2136(R)

Barium isotopes Ba^{131}

decay scheme revision from coincidence studies of γ rays, 9: 2062(J)

Barium isotopes Ba^{133}

decay scheme, 9: 2956(J)

Barium isotopes Ba^{134}

conversion spectra, 9: 1411(J)

lifetime of first excited state, upper limit of, 9: 1072(J)

Barium isotopes Ba^{137}

K-auger electrons from, 9: 446(J)

conversion spectra, 9: 1411(J)

neutron inelastic scattering, 9: 4204(R)

Barium isotopes Ba^{140}

absolute fission yield of, in thermal neutron fission of U^{235}, 9: 467(J)

Barium oxide–titanium oxide systems

phase studies, crystal structure, heat treatment, and constitution diagrams, 9: 3142(J)

Barium sulfates

precipitation of Ra with, 9: 1207(J)

Barium titanates

ceramics, aging in, 9: 4141

dielectric and thermal properties and lattice constants of, containing Sn^{4+} ions, 9: 2705(J)

diffusionless phase transformation and crystal structure, 9: 1861(R)

slip casting of, 9: 3215

Barley

as a test medium in studies of radiation effectiveness, 9: 3369(J)

Bartol Research Foundation, Franklin Inst.

progress reports, 9: 4204(R)

progress reports on elastic scattering, total cross sections, angular distribution, and inelastic cross reactions, 9: 3993(R)

Bases

definitions of concepts of, 9: 3056(J)

theory, 9: 3762

Bastnaesites

occurrence in Mountain Pass District (Calif.), 9: 3837(J)

Battelle Memorial Inst.

progress reports on causes of cracking in high-strength weld metals, 9: 3494(R)

progress reports on development of a radioactive-dust collector, 9: 1798(R), 1799(R), 1800(R), 1801(R), 1802(R)

progress reports on development of high-strength filler metals for welding steels, 9: 3497(R)

progress reports on effect of elevated temperature on the fatigue strength of sintered Al powder, 9: 3846(R), 3855(R)

progress reports on effect of grain size on mechanical properties of Zr and Ti alloys, 9: 3492(R)

progress reports on extrusion of titanium, 9: 2276(R)

Battelle Memorial Inst. (cont'd)

progress reports on rhenium, 9: 2722(R)

progress reports on $(NH_4)_2CO_3$ leaching of U ores, 9: 4145(R)

progress reports on spot-welded joints in Ti alloys and their behavior in fatigue, 9: 1839(R)

progress reports on spot-welding of Ti alloys, 9: 3491(R)

progress reports on an investigation of the mechanism by which B increases the hardenability of steel, 9: 3857(R)

progress reports on the development of Cr–Fe alloys, 9: 3490(R)

progress reports on the effect of grain size on mechanical properties of Ti and its alloys, 9: 1837(R)

Bearing materials

hot-hardness testing of W–Cr–U and W–Cr–V–Co tool steel and Cr–W die steels, 9: 3860

hot-hardness testing of W–Cr–V and W–Cr–V–Co tool steels and Cr–W and Cr–C die steels in liquid NaK, 9: 3507

rolling and sliding contact testing of ferrous and non-ferrous, in liquid NaK, 9: 3507

rolling and sliding contact testing of various ferrous and nonferrous, 9: 3860

Bearings

(See also appropriate subheadings under specific animals.)

high-temperature lubrication tests, 9: 1814(R)

lubrication at high temperatures, 9: 1813

lubrication phenomena for open, shielded, and anti-friction, 9: 2790(R) 2791(R)

wear resistance and calculation of stresses, 9: 2280

Behavior

effects of cumulative doses of x radiation on learning and retention in monkeys, 9: 2109

effects of total-body exposure to γ radiation on, of rats, 9: 2111

Bellows

(See also Valves.)

for liquid metal valves, testing, 9: 4179(R)

testing of stainless steel, in 850°F Na, 9: 4175(R)

Bentonites

(See also Montmorillonites.)

analysis, 9: 621(R)

alpha radioactivity in, 9: 445(J)

Benzaldehyde (labeled)

synthesis, 9: 1066(R)

Benzene

radioinduced chlorination of, 9: 1550(R)

viscosity from 90°C to its critical temperature, 9: 2332

Benzene, bromo-

derivatives of, Br^{79} and Br^{81} nuclear quadrupole resonances in, 9: 2013(

Benzene—carbon tetrachloride systems

effects of radiation on, with indicator sensitizer solutions, 9: 2847(R)

Benzenediacetic acid, diethyl ester

isotope effects in condensation of, 9: 4101(R)

Benzoic acid

metabolism of, effects of total-body x irradiation on, in rats, 9: 484(J)

photoinitiated oxidation of, by ferric ions in aqueous solution, 9: 3061

radiation chemistry, 9: 2136(R)

Benzoyl peroxide

decomposition of cyclohexane solution of, to form phenyl benzoate, 9: 4205(R)

reaction mechanisms with triphenylmethyl radicals, 9: 2331(R)

Berkelium
chelation with thenoyltrifluoroacetone, 9: 924(J)
Berkelium isotopes Bk^{249}
decay, half lives, and neutron capture cross sections, 9: 1489
Beryl reserves (Colo.)
distribution in Quartz Creek Pegmatite District, 9: 4156(J)
Beryllium
abundance in primary cosmic rays, 9: 1299(J)
analytical one-electron wave functions in multi-configurational approximation for, 9: 2086(J)
attenuation of 190-Mev deuterons, 9: 778
backscattering from, bombarded by 1- and 2-Mev electrons, 9: 2041(J)
bremsstrahlung differential cross sections produced in, by 1-Mev electrons, 9: 427(J)
charge equilibrium ratios for H ions from proton bombarded, 9: 2486(J)
chemical analysis, review, 9: 4200(J)
effects of, as an alloying addition, 9: 982(J)
elastic scattering of 125-Mev electrons by, 9: 1383(J)
energies of K transitions of π-mesonic x rays from, 9: 1909(J)
exploration for, book, 9: 960(J)
μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)
π-mesonic x-ray K lines of, 9: 671(J)
neutron filters of, investigation, 9: 2099(R)
neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)
neutron production by 340-Mev protons, 9: 778
nucleon total scattering cross sections, 9: 3673(J)
photonuclear reactions, 9: 2449(J)
polarization of 425-Mev protons scattered elastically from, 9: 2039(J)
polarization of protons by scattering from, 9: 1110(J)
production of μ meson pairs by 345-Mev bremsstrahlung, 9: 1336(J)
proton total cross sections at 208 and 315 Mev, 9: 358(J)
radiometric determination, 9: 2634
reaction with fused NaOH, 9: 1466(R)
scattering cross sections for deuterons at 4.0 to 7.8 Mev and protons at 3.0 to 6.5 Mev, 9: 2944(J)
solution of the Fock equations for, in a two-configurational approximation, 9: 2087(J)
spectrographic determination of, in air dust, 9: 122(J)
spectrographic determination of, in ores and rocks, 9: 162
three-quantum annihilation of positrons in, 9: 249(J)
tissue reactions following injection of, in rats and rabbits, 9: 505(J)
toxicology of dust, 9: 1913(J)
volumetric determination in beryls and associated minerals, 9: 2165(J)
Beryllium–aluminum alloys
alloying effect of Be on properties of, 9: 982(J)
Beryllium–aluminum–iron compounds (intermetallic)
crystal structure, 9: 2310(J)
Beryllium carbides
hot pressing, 9: 174
Beryllium chelates
with 2,4-pentanedione, formation constants, enthalpy, and entropy, 9: 3390(J)
Beryllium citrate complexes
formation and ion-exchange studies of at various pH's, 9: 2675(J)
Beryllium–cobalt–copper–zinc alloys
mechanical properties, 9: 3509
Beryllium–copper alloys
alloying effect of Be on properties of, 9: 982(J)
corrosion by hydraulic fluids, 9: 2795(R)
heat treatment in a 60-kev horizontal furnace, 9: 1891(J)
phase studies, 9: 2748(J)
Beryllium, dimethyl-
reaction with Li Al hydrides to form methyl Be hydride, 9: 1740
Beryllium hydrides
methyl, preparation and properties, 9: 1740
Beryllium isotopes Be^7
energy levels, 9: 1067(R), 3656(J)
formation of, by interaction of cosmic radiation in N, 9: 3655(J)
gamma spectra, 9: 4333
microchemical preparation, 9: 4083(J)
Beryllium isotopes Be^8
energy, half life, and spin, 9: 3626(J)
Beryllium isotopes Be^9
deuteron reactions (d,d), 9: 1066(R)
deuteron reactions (d,n) and (d,p), 9: 3656(J)
deuteron reactions (d,p), 9: 1397(J)
deuteron reactions (d,p) at 0.60 to 1.45 Mev, angular distributions, 9: 4293(J)
deuteron reactions (d,t), angular distribution, 9: 1651(J)
deuteron reactions (d,t) at 0.60 to 1.45 Mev, angular distributions, 9: 4293(J)
neutron elastic scattering and energy levels, 9: 1067(R)
neutron reaction (n,2n), cross section, 9: 2017(J)
nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)
thermonuclear reactions of protons with, in stars, 9: 3647(J)
Beryllium isotopes Be^{10}
deuteron reactions, 9: 1353(J)
electromagnetic separation, 9: 1955
energy levels, 9: 1353(J)
Beryllium–magnesium alloys
alloying effect of Be on properties of, 9: 982(J)
Beryllium–nickel alloys
alloying effect of Be on properties of, 9: 982(J)
Beryllium oxide crucibles
preparation and properties of, for molten Ti, 9: 2246
Beryllium oxide–titanium systems
hardness and microstructure, 9: 2246
Beryllium oxides
preparation by electrolysis of beryl, 9: 528(J)
production from beryl by fluoride extraction, 9: 1787(J)
properties of, effect of molten Ti on, 9: 2246
reaction of Th with, at high temperatures, 9: 1247
thermal conductivity, 9: 2793(R)
Beryllium poisoning
therapy, with aurintricarboxylic acid, 9: 3(R)
Beryllium reserves (Colo.)
occurrence in Crystal Mountain District, 9: 3157(J)
Beryls
distribution in Quartz Creek Pegmatite District (Colo.)
Bessel functions
machine computation of, 9: 1596

Beta decay

calorimetric measurement of absolute no. of γ quanta during, 9: 1972(J)

conference on, 9: 3968

coupling constants of scalar and tensor interactions in, of Bi^{210}, 9: 2508(J)

Fermi interaction in, 9: 2503

intensity rules for, to rotational states, 9: 2501

internal and external bremsstrahlung associated with of S^{35}, 9: 2969(J)

molecular excitation in, 9: 2995(J)

table of total disintegration energies, 9: 805(J)

theory, T values for low-lying states, 9: 3965(R)

Beta particles

(See also appropriate subheadings concerning beta emission or beta reactions under specific elements and isotopes.)

absorption in thin layers of Ni, Al, and Co, and relation to surface counting for diffusion measurements, 9: 4000(J)

age-diffusion theory for dosage determinations, 9: 400

atmospheric ionization by, from ground, 9: 3153

calorimetry, 9: 1972(J)

from carbon and hydrogen isotopes, detection and measurement by isotopic gas analysis, 9: 2180(J)

in coincidence with γ rays, β spectrometer for study, 9: 718(J)

contribution of, to geologic age determinations, 9: 953(J)

counting, bremsstrahlung detection by scintillator for, 9: 3950(J)

detection and measurement of, from C^{14}, design and performance of scintillation counter for, 9: 701

detection and measurement of, performance of a liquid scintillation counter, 9: 2136(R)

detection and measurement of, in determinations of the basic weight of fibrous materials, 9: 307(J)

detection and measurement of, in paper chromatograms of labeled compounds, 9: 3263(J)

detection and measurement of, survey meter design, 9: 3937

diffusion effects in radioactive sources, 9: 2040(J)

dosimetry of, from internally administered sources, 9: 498(J)

effects of, on skin, 9: 836(J)

effects of, on tumor nuclei, 9: 2547(R)

effects of exposure to, on inflammatory response in skin, 9: 830(J)

effects of, from I^{131}, on thyroid gland of salmon parr, 9: 828(J)

effects of intravenously injected P^{32}, on reticulo-endothelial systems, 9: 1717(J)

effects of skin exposure in mice, 9: 2565(J)

effects on cell growth, in tumors, 9: 3(R)

effects on polystyrene, polyethylene and Teflon, 9: 2664(J)

energy absorption and ionization calculation for irradiation of ferrous ammonium sulfate solutions with, 9: 2201(J)

hematological effects of, from Sr^{90} in monkeys, 9: 2114(J)

from incorporated P^{32}, inactivation of bacteriophage by, 9: 3367(J)

induction of cataracts by exposure to, in rabbit and human eyes, 9: 2118(J)

from internally administered P^{32}, effects on survival times of patients with chronic leukemia, 9: 3037(J)

ionization in pure gases by, determination of average energy to produce ion pairs, 9: 3899(J)

ionization of gases by, 9: 2539(R)

measurement of, from thick sources, 9: 4015(J)

pathological effects of, on developing embryos in rats, 9: 19

from phosphorus^{32} plaques, effects on skin of burros, horses, cattle, and sheep, 9: 1156(R)

from K^{42}, detection and measurement, in body fluids, in the presence of γ radiation from Na^{24}, 9: 1465(J)

quantitative radiographic determination of, in single cells, 9: 1734(J)

radiation hazards from, in laboratory, control, 9: 4049

Beta particles (cont'd)

relative biological effectiveness of, in mammalian systems, compared with effects of other radiations, 9: 3007

specific activity determinations, 9: 3262(J)

surface measurement of, in surface tissues in vivo, 9: 8(J)

thyroid deficiency resulting from exposure to, from I^{131}, 9: 485(J)

from tritium, dosage determinations and biological effects in rats and man, 9: 12

x-ray excitation by, 9: 2950

Beta sources

(See also Electron sources.)

catalog of, 9: 246(J)

design of millicurie, of very limited area, 9: 292

high radiation level, development, 9: 2099(R)

measurement of β activity from thick, 9: 4015(J)

preparation and tissue distribution of colloids of Au^{198}, P^{32}, Y^{90} in animals, 9: 1459

preparation by electroplating Tl^{204} on Cu, 9: 1289(J)

preparation of a primary standard of tritium water, 9: 1697

using Au^{198} and Au^{199}, 9: 1550(R)

using Sr^{90}, for administration of skin doses, design, 9: 836(J)

Beta spectra

of carbon (C^{14}) and S^{35}, equipment and techniques for measuring, 9: 437(J)

first forbidden transitions, calculations, 9: 2504(J)

probabilities of forbidden transitions, 9: 3699(J)

theory of many- and single-particle matrix elements, 9: 3700(J)

Beta spectrometers

aberrations and resolving power for double-focusing, 9: 1619(J)

backscattering of electrons, 9: 684(J)

calibration, 9: 1121

calorimetric, for absolute γ quanta measurements, 9: 1972(J)

corrections for resolving power, 9: 2080(J)

design and performance, 9: 4247

design and performance of ring-focused magnetic, 9: 4333

design and testing of, with magnetic prisms and one magnetic lens, 9: 451(J)

design of, for studying β-γ rays in coincidence, 9: 718(J)

design of long-lens, 9: 1610(J)

design of 100-amp d-c servostabilizer for, 9: 1584(J)

design of Slätis-Siegbahn, 9: 1615(J)

design of variable field survey, 9: 293

high-luminosity sector-type, design, 9: 1969(J)

intermediate-image-focusing, adaptation of, to γ pair spectroscopy, 9: 311(J)

magnetic field measurement by nuclear resonance, 9: 1327(J)

modification of double-retarding-field, 9: 2136(R)

neutrino recoil, design, 9: 1044(J)

performance, 9: 1133

preparation and properties of thin polyvinylchloride-acetate copolymer films for 4π counting in, 9: 1613(J)

six-gap, design, 9: 4252(J)

Beta spectroscopy

identification of unknown emitters by graphical absorption analysis, 9: 2065(J)

techniques and applications in nuclear measurements, 9: 4333

Betatrons

energy of, determination by activity ratios, 9: 3990(J)

liquid H, D, and He targets for Univ. of Illinois, 9: 2469(J)

Betatrons (cont'd)
orbit stability of, experimental study, 9: 1370(J)
physical aspects and therapeutic applications of, 9: 1724(J)
therapeutic use, integral dose measurements, 9: 2878(J)
Bevatron
injector, radiofrequency system, and magnet, development, 9: 3664(R)
magnetic fields, testing, 9: 3663
Bisanthrene
thermochromism in LCAO MO study of, 9: 2144(J)
Bibliographies
on air pollution, 9: 7(J)
on atomic power and related topics (Canadian), 9: 3003(J)
Big Boulder Prospect (Colo.)
geophysical exploration and geology, 9: 3157(J)
Big Casino Claim (Colo.)
uranium distribution, 9: 1513
Big Creek Area (Alaska)
monazite occurrence in, 9: 1523(J)
Big Indian Wash Area (Utah)
mineralogy, 9: 1829
Binding energy
of neutrons, determined from (d,p) Q values, 9: 737(J)
of tritons, equivalent two-body method for, 9: 4336(J)
Biochemistry
radiation effects in, review in Annual Review of Nuclear Science, 9: 3733(J)
Biological materials
containing Ru, sample preparation for analysis, 9: 3777
grinding and particle size measurements, 9: 3720(R)
Biological phantoms
(See Phantoms.)
Biology conferences
on medical and physiological applications of radioisotopes, 9: 3719(J)
on radioinduced cataracts, 9: 3722, 3723, 3724, 3725
on the thyroid, 9: 3004
Biometry
multiple sampling applied to estimates of members of a population having a particular attribute, 9: 2103
a statistical analysis of congenital malformations from exposure to x radiation, 9: 3025(J)
Biphenyl
distillation and heat transfer, 9: 608
pyrolytic reactions of, under high heat flux conditions, 9: 608
Birch Creek District (Idaho)
exploration for U and Th deposits in, 9: 1520(J)
Birefringence
calibration of streaming birefringence apparatus, 9: 2164
Birmingham Univ. (England)
progress reports on titanium research, 9: 2738(R)
Birthday Claims (Calif.)
mineralogy, 9: 3837(J)
Bismuth
atomic heat of, between 1 and 4°K, 9: 990(J)
colorimetric determination, 9: 543(J)
complexometric titration, 9: 1201(J)
cross sections for neutron transmission and multiplication, 9: 3646(J)
effect of magnetic fields on resistivity, 9: 3577
Bismuth (cont'd)
extraction by mesityl oxide, 9: 2674(J)
gamma rays excited by scattered neutrons, 9: 3993(R)
ion exchange of, from Po at room temperature, 9: 593(J)
low-temperature specific heat, 9: 188(R)
neutron differential scattering cross sections at 3.7 Mev, 9: 4304(R)
neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)
neutron total cross section, 9: 297
neutron total cross section from 0.1 to 10.0 ev, measurement, 9: 2099(R)
proton stopping cross section, 9: 2026
radiometric determination, 9: 2634
separation and determination of, by electrochemical means, 9: 87(J)
spectrographic determination of Cd, Cr, Fe, Mn, Ni, Ag, Sn, Sb, Pb, and Sn in, 9: 1475
spectrographic determination of, in ores and rocks, 9: 162
spectrophotometric determination with Na diethyldithiocarbamate in presence of foreign metals and alloys, 9: 2172(J)
Bismuth (liquid)
diffusion in molten Bi–Pb alloys, 9: 179
diffusion in Pb (liquid), 9: 179
Bismuth alloys
phase studies of, at very low temperatures, 9: 2320(J)
Bismuth films
effects of exposure to electron beam on crystallite activity, 9: 3175(R)
electric resistance, effects of temperature, pressure, humidity and aging on, 9: 3175(R)
Bismuth–germanium alloys
phase studies, 9: 3184(J)
Bismuth(III) ions
adsorption of, from hydrochloric acid, nitric acid, and ammonium nitrate solutions with a strong base quaternary amine anion-exchange resin, 9: 1226(J)
Bismuth isotopes
alpha decay in, relation to shell model, 9: 1999(J)
Bismuth isotopes Bi^{207}
decay scheme, 9: 1067(R)
gamma spectra, 9: 4333
Bismuth isotopes Bi^{209}
deuteron reactions (d,p), proton angular distributions from, 9: 762(J)
Bismuth isotopes Bi^{210}
beta spectra, 9: 1676(J)
beta spectra, coupling constants of scalar and tensor interactions in, 9: 2508(J)
electron emission of, scattering angle in nuclear emulsions, 9: 715(J)
nuclear magnetic moment, 9: 988(R)
Bismuth isotopes Bi^{211}
decay schemes and conversion electrons, 9: 383(J)
radiation of great track length from, 9: 808(J)
Bismuth isotopes Bi^{212}
angular correlations (α-γ), spin assignments, and internal conversion coefficients, 9: 2974(J)
Auger transitions in, 9: 3331(J)
Bismuth isotopes Bi^{213}
radioactivity, 9: 2500
Bismuth isotopes Bi^{214}
decay spectrum, 9: 2976(J)

Bismuth–lead alloys

segregation of impurity Po to grain boundaries, 9: 3186(J)

Bismuth–lead alloys (liquid)

diffusion of Pb and Bi in, tracer techniques, 9: 179

Bismuth–manganese alloys

large magnetic Kerr rotation in, 9: 1540(J)

Bismuth oxides

heat and free energy of formation, 9: 529(J)

Bismuth–potassium alloys

microhardness and surface tension, 9: 3527(J)

Bismuth–sodium alloys

microhardness and surface tension, 9: 3527(J)

Bismuth–tin alloys

changes in properties of, due to crystallization, 9: 4199(J)

Bismuth–uranium alloys (liquid)

corrosive effects on stainless steel, 9: 3285

$\Delta^{9,9'}$-Bixanthene

thermochromism in, LCAO MO study of, 9: 2144(J)

Black Creek Valley Area (Ariz.)

exploration and geology, 9: 1828

Black Hills (S. Dak.)

exploration, 9: 1514(R)

Black Mesa Area (Ariz.)

geophysical exploration, 9: 2709

Black shales

petrology of U-bearing, 9: 1826(R)

Black shales (Ariz).

occurrence and analysis of, in Arizona and N. Mexico, 9: 2709

Blackbird District (Idaho)

exploration for U and Th deposits in, 9: 1520(J)

Bladder

ion transfer through mucosa of normal and artificially constructed, tracer study, 9: 1732(J)

Blanding District (Utah)

geology, 9: 2262(R)

Blast effects

synergistic effects of, with effects of total-body irradiation on mice, 9: 3744(J)

Blood

distribution of Po^{210} in, 9: 1708(J)

effects of x radiation on phagocytosis and bactericidal power, 9: 2577(J), 2578(J)

flow in liver, effects of diet, adrenaline, and chronic lymphatic leukemia on, tracer study, 9: 2609

fractions of, affinity of Po for, following injection to rats, tracer study, 9: 509(J)

proteins, protective effects of, against radiation injuries in mice, 9: 2598(J)

radiation dose to, during radioiodine therapy, methods for calculating, 9: 1173(J)

Blood circulation

effects of total-body irradiation on, in hamsters, 9: 489(J)

Blood picture

changes in, during x-ray therapy, 9: 3038(J)

effects of injected spleen homogenates on leukocyte count in irradiated mice, 9: 38

effects of shielding on radioinduced anemia and changes in platelet count, 9: 2119(J)

effects of single dose of 135 to 285 r on, in man, 9: 3012(J)

of normal human population, statistical analysis, 9: 2547(R)

Blood plasma

changes in electrophoretic patterns in, following intravenous injection of Au^{198} to dogs, 9: 829(J)

levels of desoxyribonucleases in, effects of radiation on, in rats, 9: 2579(J)

lipid levels in, effects of radiation on, in rabbits, 9: 25(J)

protein fractions of, protective effects of against radiation injuries in mice, 9: 3(R)

prothrombin levels in, effects of blood platelets on, in normal and irradiated dogs, 9: 3363

Blood platelets

effects of, on prothrombin levels in plasma in normal and irradiated dogs, 9: 3363

Blood pressure

effect of dietary Na on hypertension in humans, 9: 472(J)

Blood serum

amino acid composition, 9: 3778

amino acids of, chromatographic determination, 9: 3071

chromatographic fractionation of iodinated components, 9: 1460

concentration of Na and K in, effects of total-body irradiation on, in hamsters, 9: 489(J)

lipoprotein concentrations in, effects of radiation on, in rabbits, dogs, rats, and mice, 9: 3009

protective effects of, against radiation injuries in mice, 9: 3(R)

Blood vessels

(See also Capillaries.)

human aorta, changes with age, 9: 4040(J)

Blood volume

determination of, after injection of Cr^{51}-labeled red cells, 9: 3730(R)

measurement of, by external counting following administration of radioxenon, 9: 4039(R)

Body fluids

ascitic fluid, changes in electrophoretic patterns in, following intravenous injection of Au^{198} to dogs, 9: 829(J)

compartments of, effects of x radiation on, in human subjects, 9: 3031(J)

simultaneous determination of exchangeable body Na and K in, tracer study, 9: 1465(J)

Boerlin Ranch Area (Nev.)

exploration and geology, 9: 1516(J)

Boilers

cracking in stainless steel auxiliary, for minesweepers, 9: 3168

design and fabrication of Bethelhem hot-water heater and stainless steel cyclotherm, for minesweepers, 9: 3168

effect of pressure on heat transfer coefficient in, 9: 1242(J)

leak testing of Si bronze cyclotherm-type auxiliary, for nonmagnetic minesweepers, 9: 3169

steam generators, testing, 9: 4179(R)

stress-corrosion of, made of stainless steel, 9: 3145

stress-corrosion of Si bronze and stainless steel, for minesweepers, 9: 3168

stress-corrosion testing in $HgNO_3$ solutions of Si bronze cyclotherm-type auxiliary, for nonmagnetic minesweepers, 9: 3169

Boiling

density transients in volume heated boiling systems, 9: 936(R)

film and bubble formation during, role in heat transfer, 9: 4129

heat transfer during, 9: 1238(J)

heat transfer in liquids by, 9: 1811(J)

heat transfer to boiling water forced through a uniformly heated tube, 9: 1804

heat transfer to liquid undergoing, from heating surface by free convection, 9: 1810(J)

heat transmission at, of various one-component liquids at free convection, 9: 1809(J)

Boiling Experimental Reactor
design, 9: 3293(J)

Boiling reactors
(See Homogeneous boiling reactors.)

Bonanza Creek (Alaska)
exploration, 9: 628(J)

Bonding
(See also Bonds; Brazing; Diffusion; Welding.)
eddy current thickness measurement of, 9: 167(R)
equipment for, 9: 4114(R)
nondestructive inspection of adhesive, for sheet metal, 9: 167(R)
nondestructive testing of metal-to-metal, 9: 3523
ultrasonic inspection of, of sheet metal, 9: 1263(R)

Bonds
coordinate, kinetics of formation, 9: 2624(J)
tables of energies for estimating standard heats of formation, 9: 2785

Bone marrow
(See also Hematopoietic System.)
depression of Fe^{59} uptake by erythrocytes in, as a test of degree of radiation damage in mammals, 9: 3007
effects of homogenates of, on radiation injuries in mice, 9: 3370
factor in, responsible for hematopoietic recovery following systemic irradiation in mice, 9: 2596(J)
homogenates, effects of injections on success of skin grafting in mice, 9: 2560(J)
injected rat, administered with and without cortisone, effects on recovery of lethally irradiated mice, 9: 4051
injected suspensions of, biochemical effects in rats, tracer study, 9: 1176
injections, effects on inhibition of tumors in irradiated mice, 9: 2597(J)
protective effects of injected, against radiation injuries, 9: 18
radiation protection by grafted, in adult mice, 9: 841(J)
therapeutic effects on radiation injuries, 9: 837(J)

Bone tumors
following administration of Sr^{89} in mice, 9: 2547(R)
geographic distribution, 9: 3(R)

Bones
(See also Skeleton.)
determination of Sr^{90} in, following dietary administration, 9: 846
growth, effects of radioinduced thyroid deficiency on, in mice, 9: 485(J)
radioautographic analysis of, preparation of undecalcified samples, 9: 2547(R)

Bonniebell Claims (Utah)
mineralogy, 9: 1829

Borax
toxicology of, for laboratory animals and man, 9: 844

Borazole
counting properties of proportional counter filled with, for detection of thermal neutrons, 9: 2417

Boric acid
adsorption of, by polyvalent forms of anion-exchange resins, 9: 2212(J)
chemical determination of, in tissues, 9: 53
colorimetric determination of, with carmine, 9: 3069
ion exchange of, from D_2O, 9: 3097
thermodynamic properties, 9: 1742
toxicology of, for laboratory animals and man, 9: 844
ultraviolet-absorption determination, 9: 53

Boric acid–water-d_2 systems
separation of boric acid from, by ion exchange, 9: 3097

Boride crucibles
preparation and properties of Ti, Zr, and Cr, for molten Ti, 9: 2248

Borides
metal, quantum theoretical study of covalent B-B bonds in crystals of, 9: 4068(J)
physical properties of cemented, 9: 150(R)
preparation and x-ray-diffraction analysis of metallic, 9: 3380
preparation by vacuum technique, 9: 1821(J)

Borine, trimethoxy-
reaction with B^{10}-enriched boron trifluoride etherate, 9: 3055
toxicity, 9: 4054

Borine, trimethoxy--methanol systems
electrolytic decomposition, 9: 516

Borines
mass spectra and thermal decomposition of dimethylphosphinoborine trimer, 9: 3054

Borohydride ions
nuclear magnetic resonance spectra and structure, 9: 918(J)

Borohydrides
preparation and chemical reaction of organic, 9: 4062(R)

Boron
abundance in primary cosmic rays, 9: 1299(J)
angular distribution of γ radiation from proton bombardment, 9: 1396(J)
bibliographies, 9: 4063
chemical determination of, in animal tissues, 9: 53
colorimetric determination of, in U and U solutions, 9: 2163
determination of, in Mg alloys, 9: 3480
effects of injected, on blood circulation, and toxic effects on mice, 9: 4039(R)
effects on mechanical properties of Mg alloys, 9: 3480
electric properties of crystalline, 9: 2788
electrochemical preparation of, 9: 596
electrolytic determinations in organic boron compounds, 9: 2161
electrolytic separation from molten inorganic electrolytic baths, 9: 52
flame photometric determination, effects of acids and methanol concentration and of various anions and cations on, 9: 2173(J)
neutron elastic scattering and energy levels, 9: 1067(R)
proton reactions (p,γ), 9: 1067(R), 1396(J)
proton total cross sections at 208 and 315 Mev, 9: 358(J)
spectrographic determination in Ti and Ti alloys, 9: 639(R)
spectrographic determination of, in ores and rocks, 9: 162
thermal neutron absorption cross section, 9: 1632(J), 3284(J)
volumetric determination, 9: 52

Boron bromides
reactions with BCl_3, 9: 2629(J)

Boron carbide crystals
x-ray scattering by neutron irradiated, 9: 428

Boron carbides
effects of radiation on crystal structure of, 9: 428

Boron chloride complexes
with ethyl ether, electrolytic decomposition, 9: 516

Boron chlorides
infrared spectra of kinetics of gas-phase BF_3–BCl_3 reaction, 9: 3066(J)
reactions with BBr_3, 9: 2629(J)

Boron–chromium–molybdenum systems
physical properties, 9: 150(R)

Boron–chromium–nickel systems
hardness measurements, 9: 3822(J)
properties of, as high-temperature brazing alloys for thin sheet metals, 9: 1886(J)

Boron–chromium systems
physical properties, 9: 150(R)

Boron compounds

bibliographies, 9: 55, 2134, 4063

chemical analysis, instrumental methods of, conductometric, polarographic, spectrographic, and volumetric analysis, 9: 1763

chemical reactions of $NaB(C_6H_5)_4$, 9: 2613

electrolytic determinations of B in organic, 9: 2161

organic, chemical properties and methods of preparation, 9: 1741

organic, surface tension, density, index of refraction, and atomic parachor, 9: 51

organo-, preparations and reactions of heterocyclic, with di-Grignard reagents prepared from pentamethylene bromides, 9: 597

preparation and chemical reactions of organo-borohydrides, 9: 4062(R)

ultraviolet and infrared absorption spectra of organic, 9: 3756

Boron crystals

cleaning, sorting, and mounting of microscopic, for electrical measurements, 9: 1302

Boron fluoride addition compounds

with diethyl ether, chemical reactions, 9: 4057

Boron fluoride–ammonia systems

preparation, properties, and reaction mechanisms, 9: 515

Boron fluoride complexes

with ethyl ether, reaction with lithium borohydrides and trimethoxyborine, 9: 3055

Boron fluoride–formamide, *N,N*-dimethyl- systems

chemical and thermal properties and reduction, 9: 2615

Boron fluorides

in anhydrous hydrofluoric acid, conductance and vapor pressure of, 9: 867(J)

infrared spectra of kinetics of gas-phase BF_3–BCl_3 reaction, 9: 3066(J)

preparation and reaction mechanisms, 9: 597

reactions with NH_3, dimethylamine, n-butylamine, t-butylamine, and pyridine, 9: 2624(J)

Boron halides

preparation of by reaction of boric oxide with alkali metal halides and alkaline earth halides, 9: 598

Boron hydride poisoning

therapy with various agents, negative results, 9: 53

Boron hydrides

adsorption isobars and isotherms, and decomposition, and preparation, 9: 3891

adsorption of, by silica gel and activated charcoal, 9: 53

chemical properties and methods of preparation, 9: 1741

detector for measuring atmospheric pollution by, 9: 98

isotopic exchange reaction between, and D_2, 9: 1182

nuclear magnetic resonance spectra and structure, 9: 918(J)

spectrographic determination of, 9: 53

spectrophotometric determination in air and purity determination, 9: 3069

thermal conductometric determination of D in partially deuterated, 9: 1203(J)

toxicity of, for mice, rats, and rabbits, 9: 2606(J)

toxicity of, for rats, rabbits, and dogs, 9: 2607(J)

toxicology of, for laboratory animals and man, 9: 844

toxicology of, in rabbits, dogs, monkeys, mice and humans, 9: 53

ultraviolet-absorption determination, 9: 53

Boron iodides

preparation and reaction with NH_3, 9: 515

Boron isotopes B^8

range-energy relations, 9: 408(J)

Boron isotopes B^{10}

alpha reactions (α,p), 9: 2331(R)

Boron isotopes B^{10} (cont'd)

deuteron reactions (d,γ), energy and intensity of γ rays from, 9: 379(J)

deuteron reactions (d,n) of, angular distribution of neutrons from, 9: 407(J)

deuteron reactions (d,p), angular distribution and yield of protons from, 9: 406(J)

nuclear magnetic moment of, calculated by proton-neutron coupling, 9: 742(J)

thermonuclear reactions of protons with, in stars, 9: 3647(J)

Boron isotopes B^{11}

deuteron reactions (d,γ), energy and intensity of γ rays from, 9: 379

deuteron reactions (d,n), angular distribution and energy spectra of neutrons from, 9: 761(J)

energy levels in, following inelastic scattering of α particles by Li^7, 9: 420(J)

nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)

proton reactions (p,γ), angular distribution, 9: 2019(J)

thermonuclear reactions of protons with, in stars, 9: 3647(J)

Boron nitrides

activation determination with α source, 9: 1650(J)

electronic structure, theory, 9: 1626(J)

Boron oxide–lithium oxide–silicon oxide systems

thermal expansion, 9: 1555

Boron oxide–lithium oxide–water systems

phase studies, 9: 4073(J)

Boron oxides

chemical reactions, 9: 2613

heat and free energy of formation, 9: 529(J)

reaction of, with alkali metal halides and alkaline earth halides to prepare B halides, 9: 598

vaporization, 9: 2627(J)

vaporization, vapor pressure, and spectra, 9: 2132

Boron steel

hardenability of, as a function of grain size and B additions, 9: 3857(R)

Boron–zirconium systems

size of interstitial solute atoms, lattice expansion, and electronic properties of close-packed, 9: 1780(J)

Borosilicate glass

thermal conductivity, 9: 946(R)

Bosons

decay of θ^0 particle, charge conjugation in, 9: 3702(J)

phase transitions in Bose gas, second-order, 9: 4028(J)

Boundary layer

(See also appropriate subheadings under Gas flow.)

control by porous suction, theory, 9: 2695

in laminar gas flow, mathematical analysis, 9: 3450

Bow Knot Area (Utah)

mineralogy, 9: 1829

Brain

effects of radiation on brainstem and hypothalamus in primates, 9: 833(J)

effects of radiation on hypothalamus in primates, 9: 833(J)

histological, metabolic, and conditioned-reflex effects of local x irradiation, 9: 2588(J)

localization of injected colloidal Au^{198}, with and without Ag-coating, 9: 1172(J)

metabolism of cholinesterase in, of rats, 9: 61(R)

Brain tumors

radiotherapy, effect of radiosensitivity of brainstem and hypothalamus on, 9: 832(J)

simplified apparatus for detection of, 9: 1975(J)

Brain tumors (cont'd)

therapy, using radioactive gold particles implanted by stereotoxy, 9: 2127(J)

Brass

corrosion of low-leaded, by alternate exposure to liquid and gaseous fluorine, 9: 4142

creep of β, influence of order-disorder transformations on, 9: 176

effects of cold deformation on Young's modulus of, 9: 2769(J)

mechanical properties and resistance to cavitation corrosion in fresh water and sea water, 9: 3148

metallographic etching of, reaction potentials in various etching reagents, 9: 646(J)

polarization of, in 3% NaCl solution, 9: 2259(J)

wear resistance with silicone greases, effect of composition on, 9: 1814(R)

Brass powders

resistance sintering under pressure, 9: 1878(J)

Brazing

(See also appropriate subheadings under specific materials; see also Brazing alloys; Welding.)

evaluation of techniques for, of Mo, for high-temperature service, 9: 2781(J)

of titanium and Ti alloys by high-temperature alloy fusion, 9: 645(J)

Brazing alloys

brittle failure of 60% Mn–Ni, causes and prevention, 9: 4169

evaluation of, for Mo for high-temperature service, 9: 2781(J)

for titanium and Ti alloys high-temperature alloy fusion, 9: 645(J)

use of B–Ni–Cr systems as, for thin sheet materials, 9: 1886(J)

Breath

assay of, for C^{14} labeled CO_2 in humans, equipment, 9: 3940(J)

Breeder reactors

(See also Experimental breeder reactors.)

design and economic factors associated with, 9: 1701(J)

Bremsstrahlung

(See also appropriate subheadings under specific decay processes, charged particles, and isotopes.)

detection and measurement of, from liquid samples containing P^{32}, 9: 1981(J)

differential cross sections for, produced by 1-Mev electron in Be and Au, 9: 427(J)

internal and external, associated with β decay of S^{35}, 9: 2969(J)

low-energy, scintillation spectrometry of, 9: 3260(J)

nuclear reactions, 9: 2449(J)

in penetrating showers produced in Pb and C at 11,200 ft, 9: 1929(J)

photodisintegration of C^{12} by 330-Mev, 9: 4294(J)

polarization, 9: 797(J)

production of, effect of finite nuclear size on, 9: 3623(J)

reactions with C at 310 Mev, π^+ meson production from, 9: 2434(J)

spatial distribution of energy dissipated by 40-Mev, incident on H_2O, calculation, 9: 422(J)

study of, for very low and very high energies, 9: 1937(J)

Brittleness

(See Ductility.)

Broken Shoe Deposit (Utah)

uranium distribution, 9: 1513

Bromine

crystalline, Zeeman splitting of nuclear quadrupole resonance line in, 9: 1303(J)

isotopic composition in nature, 9: 2346(J)

nuclear quadrupole coupling, 9: 1340(J)

spectrophotometric determination in glacial acetic acid saturated with KBr, 9: 3069

Bromine (cont'd)

Volhard determination of, in $MoBr_3$, 9: 2792(R)

Bromine fluoride systems

liquid-vapor equilibria for BrF_5–BrF_3, 9: 3786

Bromine fluorides

infrared spectra of BrF_3 and BrF_5, 9: 897(J)

preparation, properties, and chemistry of reactions in, 9: 892(J)

Bromine isotopes

mass ratios of, determined from microwave spectra of alkali halides, 9: 811(J)

Bromine isotopes Br^{76}

decay schemes, measurements and interpretation, 9: 3332(J)

Bromine isotopes Br^{79}

electromagnetic separation, 9: 1957

nuclear quadrupole resonance of, in bromobenzene derivatives, 9: 2012(J)

Bromine isotopes Br^{80}

radioactivity, 9: 3965(R)

Bromine isotopes Br^{81}

electromagnetic separation, 9: 1957

gamma reactions (γ,α), 9: 3674(J)

nuclear quadrupole resonances for, in $AsBr_3$, 9: 2900(J)

nuclear quadrupole resonance of, in bromobenzene derivatives, 9: 2012(J)

Bronze

(See also Copper-tin alloys.)

mechanical properties and resistance to cavitation corrosion in fresh water and sea water, 9: 3148(J)

Brookhaven National Lab.

annual report for 1954, 9: 4038(R)

atmospheric turbulence study, 9: 341

progress reports, 9: 1781(R), 4039(R)

progress reports on unclassified research, 9: 2099(R)

progress reports on waste development project, 9: 3120(R)

Brookhaven Synchrotron

beam deflection and focusing, 9: 1366

experimental program and maintenance, 9: 2099(R)

neutron spectra, 9: 4039(R)

Brule Formation (S. Dak.)

geology and U distribution, 9: 3158(J)

Brushy Basin Member (Colo.)

exploration of, in Wray Mesa, 9: 1513

Brushy Basin Member (Utah)

geology of, 9: 160

Brushy Basin No. 1 Open Pit (Colo.)

uranium and V distribution, 9: 1513

Brushy Basin No. 3 Open Pit (Colo.)

uranium distribution, 9: 1513

BSR

(See Bulk Shielding Facility.)

Bubble chambers

liquid hydrogen, development, 9: 2890(R), 3966(R)

operation and characteristics, 9: 2425(J)

propane, particle tracks in, 9: 2422(J)

Bubbles

(See also appropriate subheadings under Boiling.)

adhesion of air, to hydrophobic surfaces in water, theoretical analysis of, 9: 148(J)

Bubbles (cont'd)
break-away cavitation behind cylinders, mathematical analysis, 9: 3127(J)
formation, kinematic structure of break-away, on a circular profile 9: 3217
pressure and erosion in cavitation region, 9: 1241(J)
shapes of cavitation region on a transverse foil in a normally incident stream, 9: 3128(J)
structure of the cavitation region, 9: 1240(J)
vapor, in liquids in metastable thermodynamical equilibrium and under ion bombardment, 9: 2663(J)
Buckhorn Mica Mine (Colo.)
geophysical exploration and geology, 9: 3157(J)
Buckland–Kiwalik District (Alaska)
uranium distribution in, 9: 1523(J)
Bulbs
effects of radiation on growth and salt uptake by, 9: 26(J)
Building materials
(See also specific materials.)
alpha radioactivity in, 9: 445(J)
survey, corrosion data charts, and directory, 9: 137(J)
Bulk Shielding Facility
design and nuclear characteristics, 9: 2907
power calibration and neutron flux measurements, 9: 1641
reactivity measurements with water-reflected lattice, 9: 750
temperature coefficient, control rod calibration, power level experiments, and poisoning, 9: 750
Bullsnake Claim (Calif.)
geology, 9: 3837(J)
Bureau of Mines, Fuels Technology Div., Pittsburgh
progress reports on flow properties of fine particles, 9: 4126(R)
Burns
flash, protective effects of fabrics against, 9: 481
production of, of skin, effects of color in swine, 9: 4045
protective effects of a light poncho material against, 9: 4050
radiant energy, of skin, protection afforded by fabrics, in pigs, 9: 1157
Burros
lethal effects of radiation, 9: 2567(J)
1-Butanol–water systems
mass transfer in a horizontal liquid-liquid extraction tube, properties affecting the film coefficients of, 9: 2208
2-Butanone–water systems
mass transfer in a horizontal liquid-liquid extraction tube, properties affecting the film coefficients of, 9: 2208
Butcher Hollow (Penna.)
mineralogy and U distribution, 9: 164(J)
Butler Wash Group (Utah)
mineralogy, 9: 1829
Butter yellow
(See Azobenzene, dimethylamino-.)
Butyl phosphate–acetone, thenoyltrifluoro--kerosene systems
solvent extraction of Pr and Nd in, 9: 906
Butyl phosphate–kerosene systems
mechanism of U extraction by, 9: 585
solvent extraction of Pr and Nd in, 9: 906
Butyl phosphate–nitric acid systems
solvent properties of, for rare-earth nitrates, 9: 901
Butyl phosphate–nitric acid–uranyl nitrate systems
uranium solvent extraction from, performance of a louvre-plate redistributor for large-diameter pulse columns in, 9: 588(J)
Butyl phosphates
mechanism of U extraction by, 9: 585

C

Cadmium
absorption of cosmic μ mesons, 9: 721
coulomb excitation, 9: 1066(R)
cross sections for neutron transmission and multiplication, 9: 3648(J)
diffusion of, in single crystals of Ag, tracer study, 9: 668(J)
electrical and thermal conductivities of, near 225°K, 9: 637
electrodeposition on motorettes, procedure for, 9: 1554(R)
electroforming from fluoborate and cyanide baths, 9: 3495
electron and positron absorption in, 9: 415(J)
heat of solution, in liquid Sn, 9: 4178
isotope shift in λ4415 Cd II, 9: 453(J), 4334(J)
lattice and grain boundary self-diffusion in, 9: 3188(J)
neutron differential scattering cross sections at 3.7 Mev, 9: 4204(R)
neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)
neutron resonances, 9: 1073(J)
nuclear isomers, 9: 1067(R)
photon scattering cross section, 9: 4205(R)
photoneutron yield, measurement with NaI crystal, 9: 3944(J)
quantitative determination of divalent, using a high-frequency oscillator and ethylenediaminetetraacetic acid, 9: 2169(J)
radiochemical determination, 9: 876
radiometric determination, 9: 2634
secondary electron production from, by Cd ions, 9: 1562(J)
solid-solubility curve of, in Zn, 9: 2770(J)
spectrographic determination in Bi, 9: 1475
spectrographic determination of, in ores and rocks, 9: 162
Cadmium arsenides
electric conductivity, 9: 1467(R)
Cadmium chelates
with 2,4-pentanedione, formation constants, enthalpy, and entropy, 9: 3390(J)
Cadmium chloride–potassium chloride system (liquid)
electric conductivity, 9: 2139(J)
Cadmium chloride–zinc chloride–water systems
activity coefficients at 25°C, 9: 3795(R)
Cadmium coatings
on steel, corrosion and weldability of, 9: 171
Cadmium crystals
effects of α irradiation on creep and hardness of, 9: 433(J)
Cadmium–gold alloys
cubic to orthorhombic diffusionless phase changes in, 9: 3885(J)
diffusionless phase transformation, crystal structure, electric conductivity, thermal expansion, ferro-elastic behavior, effects of shear, bending, thermal, compression and tensile stresses, and heat treatment, 9: 1861(R)
Cadmium iodides
low-temperature heat capacity and entropy of, 9: 3221(J)
Cadmium ions
equilibrium formation constants for reaction in aqueous solution of acetylacetonate ion with, 9: 1752(J)
secondary electron production from Cd targets by, 9: 1562(J)
Cadmium isotopes
electric excitation energy levels and pulse height spectra, 9: 4205(R)

Cadmium isotopes Cd^{111}

angular correlations, effect of electric quadrupole interactions and magnetic I-J coupling, 9: 3622

effect of electric quadrupole interaction on γ-γ correlation, 9: 2482(J)

hyperfine structure and Cd^{113}/Cd^{111} magnetic moment ratio, 9: 453(J)

magnetic moment of the 247-kev excited state of, 9: 3282(J)

nuclear quadrupole interactions, 9: 2898(J)

nuclear quadrupole moments by γ-γ angular correlations, 9: 1348(J)

Cadmium isotopes Cd^{113}

hyperfine structure and Cd^{113}/Cd^{111} magnetic moment ratio, 9: 453(J)

Cadmium isotopes Cd^{115}

disintegration of, 9: 1347(J), 3335(J)

Cadmium–magnesium compounds (intermetallic)

ordering in, 9: 637

thermodynamic properties, 9: 2735(R)

Cadmium oxides

heat and free energy of formation, 9: 529(J)

Cadmium–silver alloys

heat of formation, 9: 4178

heat of solution, in liquid Sn, 9: 4178

vapor pressures over solid α, equipment for measuring, 9: 3177(R)

Cadmium sulfide crystals

detecting element in radiation probe of high resolution, radiation response of, 9: 1333(J)

Cadmium tungstate crystals

luminescent efficiencies, 9: 232(R)

production in Verneuil furnace, 9: 1932(J)

Cadmium–zinc alloys

lattice parameters of quenched, 9: 2770(J)

Calamity Mesa Quadrangle (Colo.)

preliminary geologic map of, 9: 4155(J)

Calcium

bone deposition of, in rats and monkeys, tracer study, 9: 3730(R)

charge equilibrium ratios for H ions from proton bombarded, 9: 2486(J)

chemical analysis for O_2, 9: 3070

chromatographic determination of, in mixtures of Na, K, Mg, and Ca, 9: 3400(J)

deuteron reactions (d,p), 9: 2331(R)

effects of deficiency of, on chromosome breakage in Tradescantia, 9: 3006(J)

effects of dietary, on bone deposition of Sr^{90}, 9: 846

effects of dietary, on metabolism of Ca and P in rats, and excretion of Sr in milk of dairy cows, tracer studies, 9: 1156(R)

exchange with Ra in prototype bone apatite, 9: 847

excretion of, in Wilson's disease, effects of Ca EDTA on, 9: 1739

foliar absorption and metabolism of, in strawberries, tracer study, 9: 3751

gamma reactions (γ,n) and (γ,p), cross sections, 9: 3301(J)

ion exchange separation and titrimetric determination of Li, K, and Na in presence of, 9: 1200(J)

isotope abundances in certain minerals, 9: 4234(R)

isotopic exchange between tricalcium phosphates and solutions of, tracer study, 9: 90(J)

metabolism of, effects on microstructure of collagen in rat tails, 9: 3(R)

metabolism of, in plants and animals, tracer studies, 9: 1156(R)

β-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)

radiochemical determination, 9: 876

tissue distribution of, in cattle, tracer study, 9: 1156(R)

uptake of, by bean plants, effects of environmental factors, 9: 4056

Calcium (cont'd)

x-ray spectra (soft), 9: 452(J)

Calcium carbonates

(See also Limestone.)

activity, heat of mixing, heat of fusion, and melting point of, in mixtures of fused salts, 9: 1744

moderation of fast neutrons in, 9: 3999(J)

Calcium chloride–lithium chloride–potassium chloride systems

phase studies, 9: 4059

Calcium chlorides

diffusion coefficients for aqueous solutions of, at 25°C, 9: 109(J), 4070(J)

Calcium–copper compounds (intermetallic)

crystal structure, 9: 683(J)

Calcium fluoride–calcium iodide systems

partial phase diagram of, 9: 514

Calcium fluoride–calcium oxide systems

electric conductivity and phase diagrams, 9: 1471(J)

Calcium fluoride crystals

orientation of Eu ions in, 9: 1934(J)

Calcium fluorides

adsorptive properties, 9: 50

coloration and luminescence, 9: 4314(J)

lattice constants, 9: 3408

sintering behavior, 9: 2702(R)

Calcium hydroxides

energy loss of 22-kev electrons, 9: 1665(J)

Calcium iodide–calcium fluoride systems

partial phase diagram of, 9: 514

Calcium ions

activity measurements with resin membrane electrodes, 9: 2149(J)

Calcium isotopes

deuteron reactions (d,p), angular distributions, 9: 4205(R)

separation of, by ion exchange, separation factors, 9: 290(J)

Calcium isotopes Ca^{39}

beta emission, 9: 1121

beta spectrum, measurement, 9: 4266(R)

decay and half lives, 9: 1680(J)

half life, 9: 2951

Calcium isotopes Ca^{40}

gamma reactions (γ,p) and (γ,n), yield ratios, 9: 3300(J)

Calcium isotopes Ca^{42}

energy levels, 9: 1066(R)

energy levels of, from K^{39} (α,p) reaction, 9: 2441(J)

Calcium isotopes Ca^{43}

deuteron reactions (d,p), ground state Q values from, 9: 2441(J)

Calcium isotopes Ca^{44}

energy levels, 9: 1066(R)

energy levels of, from K^{41} (α,p) and Ca^{43} (d,p) reactions, 9: 2441(J)

Calcium isotopes Ca^{45}

excretion, following simultaneous injection with Ra^{228}, 9: 2547(R)

Calcium isotopes Ca^{48}

double beta decay in, 9: 3683(J)

energy levels, 9: 2331(R)

Calcium isotopes Ca^{49}

energy levels, 9: 1066(R)

Calcium–magnesium alloys

mechanical properties, rolling, and structure, 9: 4160(R)

Calcium–nickel compounds (intermetallic)
crystal structure, 9: 683(J)
Calcium oxide–aluminum oxide–silicon oxide systems
electrolysis of slags of, containing S, 9: 2135(R)
Calcium oxide–calcium fluoride systems
electric conductivity and phase diagrams, 9: 1471(J)
Calcium oxide–magnesium oxide systems
magnetic susceptibility of, at elevated temperatures, 9: 996(J)
Calcium oxide–uranium oxide systems
oxidation of, phase diagrams, 9: 1796(J)
Calcium oxides
dielectric properties and solid-state reactions of, with binary, ternary, and quarternary systems of MgO, SnO_2, and TiO_2, 9: 3820(J)
fabrication, hydration, refractory properties, and thermal expansion, 9: 945(R)
Calcium phosphates
isotopic exchange between tri-, and phosphate or Ca solutions, 9: 90(J)
Calcium sulfates
concentration of O^{18} in water of crystallization, 9: 2267(J)
Calcium titanates
thermal expansion and x-ray diffraction analysis, 9: 945(R)
Calcium tungstate crystals
luminescent efficiencies, 9: 232(R)
production in Verneuil furnace, 9: 1932(J)
Calcium uranates
oxidation of, phase studies, 9: 1796
Calcium–zinc compounds (intermetallic)
crystal structure, 9: 683(J)
Calculators
(See Computers.)
Calf Mesa Area (Utah)
mineralogy, 9: 1829
California (Kern Co.)
uranium distribution in the Silver Lady Claims in, 9: 3154
California (San Bernardino Co.)
geology of U occurrence in Jeep No. 2 Claim in, 9: 2708
rare earth deposits in Mountain Pass District in, 9: 3837(J)
California Univ., Los Angeles
progress report on transients in boiling systems, 9: 936(R)
Californium
chelation with thenoyltrifluoroacetone, 9: 924(J)
Californium isotopes
spectra, fast coincidence studies of, 9: 2136(R)
Californium isotopes Cf^{248}
alpha and γ spectra, 9: 4320(J)
Californium isotopes Cf^{249}
decay and half lives, 9: 1489(J)
Californium isotopes Cf^{250}
decay, half lives, and neutron capture cross sections, 9: 1489(J)
Californium isotopes Cf^{251}
neutron capture cross sections, 9: 1489(J)
Californium isotopes Cf^{252}
decay, half lives, and neutron capture cross sections, 9: 1489(J)
fission yields in spontaneous fission of, 9: 3633(J)
spontaneous fission, neutron number distribution from, 9: 2021(J), 2452(J)
Californium isotopes Cf^{253}
half lives, 9: 1489(J)
Calorimeters
for absolute measurement of γ quanta during β decay, 9: 1972(J)
adiabatic, for use with condensable gases and gas-solid systems between 10 and 150°K, design, 9: 2390(J)
design and construction, 9: 185
design and construction of adiabatic specific-heat, 9: 2735(R)
design and performance of isothermal-adibatic low-temperature, 9: 238
design and performance of vacuum jacket precision, for determination of heats of combustion, 9: 278(J)
design of differential solution, 9: 3867(R)
design of isothermal jacket micro-, for heat effects of long duration, 9: 1586(J)
liquid-Sn solution, design and operation, 9: 4178
radiation balance, for comparison of radium standards, 9: 1050(J)
Calutrons
electron emission from Gd-coated filaments, 9: 2794
insulators, power supplies, and high voltage sparking, 9: 656
manual of vacuum systems and techniques, 9: 145
Cameras
(See also Photography.)
design and performance of fifteen million frame per second, 9: 1017
rotating mirror, design and operation, 9: 4208
rotating-mirror framing, for studying detonation phenomena, design, 9: 2384
Cameron Area (Ariz.)
mineralogy, 9: 1829
Cancer
(See Carcinomas; Tumors.)
Cancer-inducing agents
(See Carcinogens.)
Candy and Cake Claims (Calif.)
geology, 9: 3837(J)
Capacitors
life of, in radiation detection instruments, 9: 1329(J)
Cape Mountain Area (Alaska)
uranium distribution in, 9: 1523(J)
Capillaries
(See also Blood vessels.)
formation of new, following trauma of skin, effects of x irradiation on, in mice, 9: 2561(J)
Caproic acid
adsorption on Ag from aqueous solutions as inferred from H_2 overvoltage measurements, 9: 595(J)
synthesis of 4,6-dithiol caproic acid and bisnor-thioctic acid, 9: 61(R)
Caprylic acid
adsorption on Cu and Ag from aqueous solutions as inferred from H_2 overvoltage measurements, 9: 595(J)
Caprylic acids, thio-
preparation and radiation decomposition, 9: 2136(R)
Carbamic acid, diethyldithio-
as reagent in colorimetric determination of metals, 9: 4077(J)
Carbazole
electroluminescence from alternating electric fields, 9: 1974(J)
Carbide crucibles
preparation and properties of Ti, Zr, V, Nb, Ta, and W, for molten Ti, 9: 2247
Carbides
(See also specific carbides.)
polishing of, with alumina abrasives, technique, 9: 3879(J)

Carbohydrates

(See also Sugars.)

effects of radiation on, review of literature, 9: 2549

Carbon

(See also Carbon black; Diamonds; Graphite.)

angular distribution of 19-Mev deuterons scattered by, 9: 795(J)

attenuation of 190-Mev deuterons, 9: 778

backscattering from, bombarded by 1- and 2-Mev electrons, 9: 2041(J)

bombardment by high-energy protons, deuterons, and He^3 particles, neutron production from, 9: 1993(J)

bremsstrahlung reactions (γ,π) at 310-Mev, 9: 2434(J)

combustion determination in C–Ti system, 9: 1859(R)

combustion determination in highly fluorinated organic compounds, 9: 2186(J)

cross sections for neutron transmission and multiplication, 9: 3646(J)

crystal structure, mechanical properties, and thermal expansion, 9: 91

differential elastic scattering cross section for α particles, 9: 418(J)

diffusion in C–Fe systems, influence of Co, 9: 1869(J)

diffusion in ternary metallic systems, measurements and theory, 9: 4214(J)

diffusion in Ti, 9: 1859

elastic scattering of 1.92- to 3.84-Mev neutrons by, 9: 3998(J)

emission of secondary electrons (δ rays) by 1.3-Mev electron bombardment, 9: 1306(J)

energies of K transitions of π-mesonic x rays from, 9: 1909(J)

energy loss of secondary electrons in a cavity with walls of, 9: 2045(J)

external bremsstrahlung emitted from P^{32} β rays stopped in, 9: 2505(J)

gamma reactions (γ,π), 9: 3966(R)

gamma scattering cross sections at 77 and 94 Mev, 9: 2331(R)

heat of vaporization, 9: 988(R)

inhaled, metabolism in rats, tracer study, 9: 2611(J)

isotopic composition of, in carbonaceous meteorites, 9: 1834(J)

μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)

metabolism by plants, tracer study, 9: 48

neutron distribution in, from a fast neutron source, 9: 411(J)

neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)

neutron production by 190-Mev deuterons, 9: 778

neutron total cross sections, 9: 2457

nucleon total scattering cross sections, 9: 3673(J)

oxygen transfer between CO_2 and CO in presence of, from 650 to 900°C, 9: 526(J)

photonuclear reactions, 9: 2449(J)

polarization and scattering of D-D neutrons, 9: 2481(J)

polarization of high-energy protons in elastic scattering on, 9: 789(J)

preparation of radiation targets of, by heating Ni foils in presence of CH_3I, 9: 242(J)

proton reactions (p,d) at 95 Mev, angular distribution of pickup deuterons from, 9: 4307(J)

proton total cross sections, 9: 2458

proton total cross sections at 208 and 315 Mev, 9: 358(J)

removal from TiC by flotation, 9: 2703(R)

role of, in plant photosynthesis and respiration, 9: 3048

slowing down of polarized protons by, 9: 2039(J)

sources, bonding, fabrication, and metallurgical uses, 9: 2303(J)

thermodynamic functions of, to 12,000°K, 9: 1896

Carbon (activated)

absorption of boron hydrides by, 9: 53

Carbon–aluminum–titanium systems

mechanical properties, 9: 3854(R)

Carbon–aluminum–titanium–vanadium systems

tensile properties, 9: 3853(R)

Carbon black

adsorption of hydrocarbons from methanol and ethanol solutions by nonporous, 9: 1790

heats of adsorption of argon on, graphitized at successively higher temperatures, 9: 2677

replicas of, technique, 9: 262

Carbon–cobalt–iron systems

diffusion of C in, influence of Co, 9: 1869(J)

Carbon compounds

labeled, bibliography, 9: 1488

Carbon crucibles

preparation and properties of Ti, Zr, V, Nb, Ta, and W, for molten Ti, 9: 2247

Carbon dioxide–helium systems

mutual solubility of gases at high temperatures in, 9: 3239(J)

Carbon dioxide–methane systems

viscosity of, at 25°C, 9: 3213

Carbon dioxides

absorption of, by sodium carbonate solutions, kinetics, 9: 1791(J)

activated adsorption on pyrolytic nickelous oxide, 9: 65

constant-pressure specific heat, at elevated temperatures and pressures, 9: 4061

effects of, on radiation injuries in seed of barley, 9: 2593(J)

fixation of, by Rhodopseudomonas capsulatus, 9: 506

fixation of, by Rhodopseudomonas capsulatus in light and dark, 9: 61(R)

gas chromatographic elution of gases and volatile liquids from alumina, silica gel, or charcoal by, 9: 2672(J)

heat and free energy of formation, 9: 529(J)

ion pair formation, 9: 4039(R)

ionization by α particles and fission fragments, 9: 2821

oxygen transfer between CO and, in presence of different carbons from 650 to 900°C, 9: 526(J)

separation of, from human breath, equipment, 9: 3940(J)

specific heat, thermal conductivity, and viscosity of, from 0 to 600°C, 9: 2822

thermodynamic functions of, to 12,000°K, 9: 1896

Carbon–iron–nickel systems

phase studies, 9: 2317(J)

Carbon–iron systems

preparation, microstructure, and phase studies, 9: 1265(R)

size of interstitial solute atoms, lattice expansion and electronic properties of close-packed, 9: 1780(J)

surface tension, 9: 2702(R)

Carbon isotopes

gas phase measurement of β particles from, 9: 2180(J)

Carbon isotopes C^{12}

alpha reactions with, energy levels of compound nucleus O^{16*} from, 9: 418(J)

bremsstrahlung reactions ($\gamma,3\alpha$) at 330 Mev, excitation function, 9: 4294(J)

deuteron reactions (d,d), 9: 1066(R)

deuteron reactions (d,γ), energy and intensity of γ rays from, 9: 379(J)

deuteron reactions (d,p), angular distribution of protons from, 9: 384(J)

deuteron reactions (d,p), at 3.29 Mev, proton polarization in, 9: 1647(R)

Carbon isotopes C^{12} (cont'd)

deuteron reactions (d,p) identification of proton groups from, 9: 795(J)

elastic phase scattering of neutrons between 1.9 and 3.8 Mev, 9: 1386(J)

electromagnetic separation, 9: 2839

energy levels, 9: 761(J), 1393(J)

gamma rays from 14-Mev neutron bombardment, 9: 3650(J)

gamma reactions (γ,3α), yield of stars from, 9: 760

gamma reactions (γ,3α) and energy levels, 9: 3656(J)

gamma reactions (γ,...), absolute cross section from 18 to 260 Mev, 9: 4292(J)

gamma reactions (γ,p) and (γ,n), yield ratios, 9: 3300(J)

independent-particle state of, at high excitation, 9: 3299(J)

nitrogen nucleus reactions (N^{14},2p), (N^{14},α), and (N^{14},2α), excitation functions for, 9: 1648(J)

proton inelastic scattering by, angular distribution of γ rays from, 9: 2455(J)

proton reactions (p,αp), mechanism of, at 32 Mev, 9: 1645

proton reactions (p,γ), high-energy γ line from, 9: 767(J)

range-energy relations, 9: 408(J)

scattering of 340-Mev protons by subshells in, 9: 2444(J)

Carbon isotopes C^{13}

alpha reactions (α,n), 9: 382(J)

angular correlation and multipolarity of electron pairs from, 9: 2010(J)

deuteron reactions (d,γ), γ spectra from, 9: 4289(J)

deuteron reactions (d,p), 9: 1393(J)

effect in thermodecomposition of ethyl bromide from 350 to 450°C, 9: 2143

energy levels, 9: 3998(J)

intermediate coupling, 9: 3625(J)

nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)

nuclear spin and gyromagnetic ration, 9: 361(J)

photoneutron production, 9: 2518(J)

proton reactions (p,γ), 9: 1067(R)

proton reactions (p,γ), γ rays from, 9: 764(J)

Carbon isotopes C^{14}

age determination of geological samples by, 9: 3472(J)

age determinations and dating by, recent advances in, 9: 1000(J)

age determinations of specific geological and archeological samples by, 9: 1286(J)

beta spectra, 9: 1124(J), 1994(R), 2506(J)

beta spectra, measurement, 9: 437(J)

biosynthesis of albumin, atropine, chlorophyll, and glucose labeled with, 9: 2105(J)

compounds labeled with, bibliography, 9: 1488

dating by, isolation of organic carbon from bones for, 9: 3473(J)

dating equipment using, improved design, 9: 1620(J)

dating of, with proportional counter filled with CO_2, 9: 3593(J)

detection and measurement of, in human breath, performance of ionization chamber, 9: 3940(J)

determination of, applied to dating of samples of charcoal, 9: 2347(J)

deuteron reactions (d,p), 9: 1350(J)

diffusion in steel, 9: 4203(J)

energy levels, 9: 1350(J), 1393(J)

intramolecular isotope effects of C^{13} and, in the decarboxylation of malonic acid at 140.5°, 9: 871(J)

proton reactions (p,γ), resonances in, 9: 1092(J)

quantitative radiographic determination of β particles from, in single cells, 9: 1734(J)

radiometric determination of, application of high-frequency induction furnace to, 9: 1476

Carbon isotopes C^{14} (cont'd)

radiometric determination of, in products formed by dissolution of neutron-irradiated ammonium bromide in water, 9: 900(J)

radiometric determination of, liquid scintillation counter for, 9: 701

as a trace element in clinical studies, 9: 3748(R)

Carbon isotopes C^{15}

nuclear properties, 9: 1350(J)

Carbon–manganese–titanium systems

fabrication, heat treatment, phase studies, mechanical properties, microstructure, and aging characteristics, 9: 1856

heat treatment, mechanical properties, microstructure, and phase studies, 9: 180(R)

phase studies and microstructure, 9: 1873(J)

Carbon–molybdenum–titanium systems

forging in inert gas, 9: 984(J)

grain growth and size, microstructure, phase studies, and tensile properties of heat-treated, 9: 975

Carbon monoxides

activated adsorption on pyrolytic nickelous oxide, 9: 65

atomic polarizations and dipole moments of, theory, 9: 2888(J)

electron collision cross-section determination with electron spectrometer, 9: 3696

heat and free energy of formation, 9: 529(J)

interaction with clean metal surfaces, 9: 2159(J)

kinetics of reaction with nitric acid, 9: 3051

oxygen transfer between CO_2 and, in presence of different carbons from 650 to 900°C, 9: 526(J)

predissociations of $C^{12}O$ and $C^{13}O$, 9: 3389(J)

radiation protection, 9: 2599(J)

thermodynamic functions of, to 12,000°K, 9: 1896

yield from decomposition of methanol by Co^{60} gamma radiation and 28-Mev He ions, 9: 2202(J)

Carbon–nickel–titanium systems

microstructure and phase studies, 9: 3457

Carbon–oxygen–titanium systems

mechanical properties, microstructure, and phase studies, 9: 1870

Carbon–silicon–titanium systems

constitution diagrams, 9: 4187

Carbon steel

blistering and embrittlement of pressure vessel, by H, 9: 1887

brazing of, with B–Ni–Cr systems, 9: 1886

corrosion in water and aqueous media at 600 and 680°F, 9: 1822

corrosion of, by wet and dry Cl_2 between 260 and 300°, 9: 158(J)

corrosion of, in acid medium, inhibitory effect of Sapamin CH, 9: 156(J)

corrosion of, inhibition by pertechnetate ion, 9: 1825

electrical and thermal conductivities of AISI C-1010, 9: 1502

spheroidize annealing, 9: 194(J)

stress values of, chart and nomograph for, 9: 3441(J)

tensile properties of welds of, over temperature range –300 to 1400°F, 9: 223(J)

tensile strength of speroidize annealed, 9: 194(J)

welding heavy section of, techniques and requirements for, 9: 223(J)

Carbon tetrachloride

mixtures with 3-methylheptane, total pressure from 25 to 80°C, 9: 1751

neutron transmission, 9: 3965(R)

Carbon tetrachloride–benzene systems

effects of radiation on, with indicator sensitizer solutions, 9: 2847(R)

Carbon tetrafluoride

heat of formation of, 9: 1774(J)

heat of formation, measurement of, from combustion colorimetry of polytetrafluoroethylene, 9: 1775(J)

Carbon–titanium systems

mechanical properties, microstructure, and phase studies, 9: 1870(J)

mechanical properties of welded, 9: 1859(R)

microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296

phase studies, vacuum annealing, machinery, and combustion determination of C in, 9: 1859(R)

preparation, double inert-gas arc melting, forging, and welding, 9: 3489(R)

preparation by nonconsumable and consumable electrode arc melting, 9: 2293(R)

room-temperature dynamic elastic modulus and its ratio to density, 9: 2728(R)

size of interstitial solute atoms, lattice expansion, and electronic properties of close packed, 9: 1780(J)

Carbon–uranium sandstone deposits (Ind.)

occurrence in coal field, 9: 1515

Carbon–uranium sandstone deposits (Utah)

occurrence in Southern Utah, 9: 3466(J)

Carbon–uranium systems

thermal conductivity at 70°C, 9: 1879(J)

Carbonaceous rocks

design and calibration of an automatic micromuffle for determination of ash in, 9: 3398(J)

Carbonaceous shale deposits (Ind.)

exploration of, 9: 1515

Carbonaceous shale deposits (Idaho)

occurrence, 9: 2263

Carbonaceous shale deposits (Wyo.)

occurrence, 9: 2263

Carbonaceous shales

(See also Black shales.)

retention of U during oxidative ashing of, 9: 881

Carbonates

(See also carbonates of specific elements; see also Uranyl carbonates.)

incorporation of, into normal and x irradiated chick embryos, tracer study, 9: 3376

Carbonyl chloride fluoride

thermodynamic properties, 9: 1769(J)

Carbonyl compounds

fundamental vibrations of molecules of type X_2CO, 9: 917(J)

Carbonyl fluoride

force constants and thermodynamic properties, 9: 1769(J)

Carbonyls

(See also specific carbonyls.)

fundamental vibrations of molecules of type X_2CO, 9: 917(J)

Carcinogens

radioactive and chemical, effects of, on mice, 9: 2565(J)

Carcinomas

cervical, radiotherapy using Co^{60}, applicator, 9: 4053(J)

cervical, radiotherapy using Co^{60}, dosimetry, 9: 4052(J)

effusions associated with, therapy with colloidal Au^{198}, 9: 1175(J)

nucleic acid content of, effects of radiation on cellular suspensions, 9: 1718(J)

therapy of, of ovaries, pleura, and peritoneum with radioactive gold, 9: 1162(J)

therapy of bronchial, with radioactive cobalt, 9: 1163(J)

Cardiography

effects of total-body irradiation on results of, in hamsters, 9: 489(J)

Carlisle Quadrangle (Utah)

photogeologic map of, 9: 2269(J), 3832(J)

Carnegie Inst. of Tech.

progress reports on lattice imperfections and grain boundaries, 9: 971(R)

progress reports on luminescent efficiency of large crystals of $CaWO_4$ and $CdWO_4$, 9: 232(R)

progress reports on radiation effects in solids, 9: 800(R)

Carnegie Institution of Washington

progress reports on alignment of Ce^{141} and Nd^{147} nuclei, 9: 354(R)

Carrizo Mountains (Ariz.–N. Mex.–Utah)

sedimentary trends in, 9: 2262(R)

Carthage Area (N. Mex.)

geophysical exploration, 9: 2709

Cascade showers

(See also showers identified by the inducing radiation, e.g., Cosmic showers.)

electron-photon, of energy spectrum at 3500 m in Pb, 9: 259(J)

electro–photon, scintillation counter study of energy spectra at 11,200 ft, 9: 4221(J)

energy estimation of, from neutral π meson decay, 9: 2360

integral equations for, 9: 1692(J)

new formulation of general three-dimensional theory of, 9: 1693(J)

penetrating, produced in Pb and C at 11,200 ft, detection and analysis with plastic scintillation counters, 9: 1929(J)

produced by high energy π meson, mean free path for, 9: 1925(J)

production of, in paraffin, graphite, iron, and lead by fast nucleons from cosmic radiation, 9: 2814(J)

theory, use of concept of sets enchained by a stochastic process in, 9: 1688

theory of, age-dependent branching stochastic processes in, 9: 813(J)

Case Inst. of Tech.

progress reports on an investigation of overcoming rheotropic embrittlement in Ti and Ti-base alloys, 9: 1848(R)

progress reports on high-temperature scaling behavior of Zr, 9: 3458(R)

progress reports on scaling of Zr at elevated temperatures, 9: 967(R)

Cast iron

mechanical properties and resistance to cavitation corrosion in fresh water and sea water, 9: 3148(J)

polishing of, with alumina abrasives, technique, 9: 3879(J)

spheroidal graphite formation in, 9: 206(J)

Castings

from high-vacuum melts, 9: 195(J)

Catalases

effects of radiation on, protective effects of cysteine, cystine, and glutathione, 9: 2199(J)

luminescence of, under high-energy γ irradiation before and after 50 kv x irradiation, 9: 1783

Catalysis

(See also appropriate subheadings under specific chemical processes.)

fundamental studies of, application of infrared spectroscopy to, 9: 50

Catalysts

(See also specific catalysts identified by material; see also Enzymes.)

adsorptive properties, 9: 50

Cataracts

radioinduced, by exposure to β particles of eyes of man and rabbits, 9: 2118(J)

radioinduced, conference on, 9: 3722, 3723, 3724, 3725

radioinduced, mechanisms of production in rabbits, 9: 494(J)

Cathode rays

(See also Electrons.)

effects of exposure to, in producing skin erythema, 9: 1158(J)

Cathodes

(See also Electrodes; Electron tubes; Mercury cathodes.)

electron emission, 9: 3251(R)

materials, 9: 1893(R)

secondary electron emission, 9: 3208(R)

Cation exchange materials

neutralization titration of, in anhydrous pyridine, 9: 882(J)

preparation and properties of disks of, 9: 913(J)

selectivities of, by osmotic behavior, 9: 3101(J)

Cations

hydration in polystyrene sulfonates, 9: 3392(J)

inorganic, chromatographic separation of, 9: 1483(J)

Catskill Formation (Penna.)

geology and U distribution, 9: 164(J)

Caves

design of, for solid-state laboratory, 9: 574(J)

equipped for the preparation of γ-sources, design, 9: 572

equipped with modified dry box for remote chemical separations, 9: 570(J), 571(J)

for handling irradiated metallurgical samples, design, 9: 551(J), 553(J) 554(J)

for handling irradiated Ra^{226}, design, 9: 552(J)

for studies of physics and metallurgy of radioactive materials, 9: 578(J)

Cavity resonators

analysis of coupled, for π mode, 9: 3987

Cellulose

biosynthesis of C^{14}-specifically labeled, from D-mannitol-1-C^{14} by Acetobacter xylinum, 9: 125(J)

Cements

(See also Adhesives; Concretes.)

corrosion resistance and applications of construction, survey and directory of, 9: 137(J)

Centrifugation

pre- and post-irradiation, effects on chromosomes of Tradescantia and Vicia, 9: 842(J)

Centrifuges

for use with molten salts and liquid metals at temperatures up to 500°C, design and performance, 9: 3789

Ceramic bodies

mechanical properties of, 9: 1820

Ceramic coatings

(See also Porcelain enamels.)

composition, preparation, properties, and testing of, for high-temperature alloy parts in nuclear reactors, 9: 2249(J)

effects on oxidation and impact strength of variously heat-treated Ti samples, 9: 3868

high-temperature resistant, development, 9: 4137(R)

permeability of base coat glasses to He, 9: 615

permeability of glass, to gases, factors affecting, 9: 616

refractory, thermal insulating properties of, at temperatures to 500°F, 9: 938

refractory properties, 9: 4137(R)

temperature-resistant, for use in nuclear reactors, 9: 1253(J)

Ceramic materials

corrosion in water and aqueous media at 600 and 680°F, 9: 1822

dielectric measurements in 3 cm wavelength region, 9: 3962

resistance to thermal stresses, factors affecting, 9: 1505

thermal fracture under quasi-static thermal stresses, 9: 1506(J)

thermal shock analysis of spherical, 9: 1497(J)

Ceramic–metal couples

production by pressed powder techniques, 9: 4138(R)

Ceramic–metal systems

(See Cermets.)

Ceramics

(See Ceramic materials.)

Cerium

absorption on clay as simulants for contaminants for nuclear detonations in harbors, 9: 658

determination by Cu-spark spectroscopy, 9: 885(J)

paramagnetic resonance absorption spectra, 9: 2075(J)

phase studies of between CeO_2 and Ce_2O_3, 9: 114(J)

preparation of carrier, by fractional precipitation and fractional distillation, 9: 3793

radiochemical determination, 9: 876

radiochemical determination in fission based on solvent extraction of Ce^{+4} with methyl isobutyl ketone, 9: 2174(J)

radiometric determination, 9: 2634

spectrographic determination of, in ores and rocks, 9: 162

Cerium chelates

with 2,4-pentanedione, formation constants, enthalpy and entropy, 9: 3390(J)

with 8-quinolinol, precipitation of, 9: 83(J)

Cerium complexes

properties of citrate, in aqueous and 50% alcohol solutions, 9: 3794

Cerium compounds

with cyclopentadiene, 9: 3096(J)

oxidation and reduction of, by ionizing radiation, 9: 1215(J)

role of oxygen radicals in oxidations and reductions of cerous-ceric system caused by ionizing radiations, 9: 1214(J)

Cerium hydrides

preparation and properties of, 9: 2205(J)

Cerium ions

radiation induced Ce(III)–Ce(IV) exchange in aqueous nitric and sulfuric acids, 9: 2668(J)

Cerium(III) ions

thermodynamic formation constants in aqueous solution for reaction of, with acetylacetonate at 30°C, 9: 1191(J)

Cerium(IV) ions

photo-oxidation of water by, mechanism of, 9: 2669

reaction between formic acid and, in aqueous solutions due to x-ray irradiation, 9: 3792(J)

Cerium isotopes Ce^{139}

decay scheme, 9: 1404(J)

Cerium isotopes Ce^{140}

spins and parities of excited states, 9: 4282(J)

Cerium isotopes Ce^{141}

disintegration, 9: 3339(J)

disintegration and decay schemes, 9: 802

nuclear alignment, γ spectra, and magnetic moments, 9: 354(R)

Cerium isotopes Ce^{144}

gamma spectra, 9: 1402(J), 1403(J), 4333

Cerium–magnesium alloys

creep behavior and microstructure, 9: 192

grain boundaries, microscopy, 9: 4161(R)

Cerium–nickel compounds (intermetallic)

crystal structure, 9: 683(J)

Cerium oxides

ordered intermediate phases in ceric oxide–cerous oxide systems, 9: 3426(J)

Cerium sulfates

crystal structure, 9: 1011(J)

Cerium sulfides
properties of, effect of molten Ti on, 9: 2248

Cermets
(Specific cermets are indexed as Systems, the names of the constituents being arranged both in alphabetical and inverted orders.)
impact strength test equipment, 9: 4140
metallurgical properties, survey, 9: 3822(J)
powder metallurgy of, review, 9: 198(J)

Cerrillos Mining District (N. Mex.)
mineralogy and exploration of, 9: 955(J)

Cesium
K absorption frequency, 9: 3698(J)
radiochemical determination, 9: 876, 2634
reaction with $BF_3 \cdot NH_3$, 9: 515
uptake and translocation of, by plants, tracer study, 9: 3752

Cesium antimonides
crystal structure, 9: 1893(R)

Cesium bromides
fluorescence and thermoluminescence in x-irradiated crystals of, 9: 3682(J)

Cesium–cesium halide systems
phase studies, 9: 3771(J)

Cesium chlorides
diffusion coefficients for aqueous solutions of, at 25°C, 9: 109(J)

Cesium chloroantimonites
crystal structure, 9: 93(J)

Cesium chloroferrites
crystal structure, 9: 93(J)

Cesium halide–cesium systems
phase studies, 9: 3771(J)

Cesium iodides
crystal structure, 9: 2375(J)
lattice constants, 9: 3408

Cesium ions
separation by ion exchange, 9: 910(J)

Cesium isotopes Cs^{135}
decay schemes, 9: 735

Cesium isotopes Cs^{136}
decay scheme, 9: 803(J)

Cesium isotopes Cs^{137}
decay schemes, 9: 735

Cesium isotopes Cs^{138}
decay schemes of Ba^{138}–Cs^{138} decay chain, 9: 2136(R)

Cesium isotopes Cs^{131}
decay scheme and uses in implant therapy, 9: 3748(R)
preparation of carrier-free, 9: 1190(J)
x-ray spectra, 9: 4101(R)

Cesium isotopes Cs^{132}
radioactivity, 9: 4101(R)

Cesium isotopes Cs^{134}
decay scheme of Cs^{134m} and, 9: 2507(J)
gamma-ray energies in decay of, 9: 1123(J)
hyperfine splitting and sign of magnetic moment of 3.1-hr metastable state of, 9: 2005(J)
nuclear hyperfine structure interaction in 3.1-hr metastable state of, 9: 2006(J)
spin and nuclear magnetic moment, 9: 988(R)

Cesium isotopes Cs^{137}
phosphotungstate precipitation method of analysis of, in solutions of long lived fission product activities, 9: 879
protection against radiation from, handbook, 9: 1452(J)

Cesium isotopes Cs^{138}
decay schemes, measurements and interpretation, 9: 3332(J)

Cesium–magnesium compounds (intermetallic)
crystal structure, 9: 683(J)

Chadron Formation (S. Dak.)
geology and U distribution, 9: 3158(J)

Chandalar District (Alaska)
exploration and geology, 9: 628(J)

Charcoal
(See also Carbon (activated).)
gas chromatographic elution of gases and volatile liquids from H_2, N_2, or CO_2, 9: 2672(J)
heats of adsorption of N on, 9: 1789
radiocarbon dating of samples of, 9: 2347(J)

Charged particles
acceleration of moving, by means of a magnetized medium, 9: 455(J)
analysis of properties of, in nuclear emulsions as functions of velocity, 9: 304
in constant electromagnetic fields, avoiding of infrared divergencies in radiative effects of, 9: 464(J)
diffusion and absorption in radial electric fields with absorber, 9: 3676(J)
elastic scattering by nuclei, generalized formula, 9: 3667
energy loss by ionization, derivation of distributions, 9: 4003(J)
focusing by TM_{21} waves, 9: 726
focusing theory, 9: 988(R)
high-order focusing by uniform magnetic field, 9: 2804(J)
interaction with electromagnetic fields, theory, 9: 4025
mass determination of, in nuclear emulsions, 9: 322(J)
measurement of tracks, emulsion tables, 9: 4245
motion in crossed electric and magnetic fields, equations, 9: 4246
multiple Coulomb scattering from extended nuclei, 9: 775
multiple scattering through small angles, theory, 9: 3996(J)
penetration of heavy, review in Annual Review of Nuclear Science,
range determination from change in ionization in cloud chamber, 9: 4205(R)
scattering, correction for, in counter experiments, 9: 1117(J)
scattering constant for, in nuclear emulsions, 9: 4303(J)
single scattering by shielded coulomb field, theory, 9: 3668(J)
trajectories in electrostatic fields, graph-analytical methods for determining, 9: 3229(J)

Charles No. 2 Claim (Utah)
mineralogy, 9: 1829

Chelates
(See also compounds used as chelation agents; see also main headings by name of metal chelated.)
chemical properties, formation, and excretory effects, 9: 1739
chemical properties and preparation, 9: 512

Chelation
of ethylenediaminetetraacetic acid with uranyl ion, 9: 3436(J)

Chemical analysis
(See also specific methods of analysis; see also appropriate subheadings under specific materials.)
isotopic dilution technique for, 9: 3783(J)

Chemical engineering

use of computers in, 9: 3387(J)

Chemical radiation detectors

(See also Radiation detection instruments (colorimetric))

calibration of cobalt glass and Ag-activated phosphate glass dosimeters, 9: 3932

conductimetric and colorimetric, performance, 9: 4242(R)

containing sensitized KBr crystals, performance as γ dosimeter, 9: 3922, 4243

gamma dosimetry with ferric orthophenanthrolene, 9: 3267(J)

investigation of acrylonitriles, benzene–CCl_4 systems, and halogenated plastics as, 9: 2847(R)

performance, 9: 899

performance, for dosimetry of γ radiation and fast neutrons, 9: 700

performance of phosphate glass containing Co for, 9: 1040

radiosensitivity of chloroform and tetrachloroethylene as, 9: 4241(R)

response to high energy radiation, 9: 2657(R)

utilizing acrylonitrile or CCl_4–benzene–indicator–sensitizer systems, 9: 2848(R)

Chemical warfare agents

(See also specific agents.)

removal from water supplies by ion-exchange materials, 9: 914

Chemicals and reagents

(See also specific chemicals and reagents.)

effects of high-energy radiation on, tested as chemical radiation detectors, 9: 2657(R)

Cherenkov detectors

characteristics and design of, review, 9: 3943(J)

cosmic-ray α particle measurements with, 9: 255

design of, for selection of slow particles, 9: 1607(J)

lead-glass plates as, possibility of use of, 9: 1962

properties of nonfocused, 9: 3590(J)

Cherenkov radiation

by cosmic particles in atmosphere, 9: 1920

emission by electron beams, 9: 3568(J)

emission by particle traversing magnetic material, theory, 9: 2043(J)

Chickens

embryos, LD_{50} determinations, 9: 822(J)

renal function, radiosensitivity, 9: 3(R)

Chinle Formation (Ariz.)

exploration and geology, 9: 1828

Chinle Formation (Utah)

exploration and stratigraphy, 9: 1256

Chisana District (Alaska)

geology, 9: 628(J)

Chloral

polarographic determination, 9: 539(J)

Chloride ions

activity measurements NaCl, KCl, and $MgCl_2$ solutions with resin membrane electrodes, 9: 2150(J)

adsorption on quartz, 9: 3111(R)

conductometric determination in alkali metals by paper chromatography, design and performance of apparatus for, 9: 2215(J)

Chlorides (liquid)

electric conductivity, 9: 2139(J)

Chlorination

of benzene under γ radiation, equipment for design, 9: 1550(R)

Chlorine

corrosive effects of, on Al, C steel, Cu, stainless steel, and Ni between 260 and 300°, 9: 158(J)

Chlorine (cont'd)

mass spectrometric study of natural and neutron irradiated, 9: 3409(J)

neutron cross sections, 9: 3965(R)

nuclear quadrupole coupling, 9: 1340(J)

proton total cross sections at 208 and 315 Mev, 9: 358(J)

radiochemical determination, 9: 876

semimicro determination in organic compounds, 9: 2166(J)

Chlorine fluorides

infrared band of a molecular complex between hydrogen fluoride and, 9: 896(J)

toxicology studies of, 9: 47

Chlorine isotopes

effect in tert-butyl chloride reactions, 9: 67(J)

mass ratios of, determined from microwave spectra of alkali halides, 9: 811(J)

relative abundances of, from mass-spectrometric analysis of $TiCl_4$, 9: 291(J)

Chlorine isotopes Cl^{33}

decay scheme, 9: 2997(J)

Chlorine isotopes Cl^{34}

beta emission, 9: 1121

decay and half lives, 9: 1680(J)

half life, 9: 2951

Chlorine isotopes Cl^{35}

deuteron reactions (d,α) and (d,p), 9: 2331(R)

deuteron reactions (d,p) and (d,α), energy levels, 9: 4205(R)

neutron reactions (n,γ) in sodium chlorate, chemical effects, 9: 3424(J)

nuclear configuration and nuclear magnetic moment of, calculated from H coupling, 9: 355(J)

quadrupole resonance frequencies of, in acid chlorides and chlorates, 9: 4276(J)

Chlorine isotopes Cl^{36}

formation of, by pile irradiation of sodium chlorate, 9: 3424(J)

half lives, 9: 2511(J)

nuclear magnetic moment, 9: 988(R)

Chlorine isotopes Cl^{37}

neutrino reactions (ν, e^-)A^{37}, neutrino detection by, 9: 2921(J)

nuclear configuration and nuclear magnetic moment of, calculated from H coupling, 9: 355(J)

Chlorine isotopes Cl^{38}

beta-gamma angular correlations, 9: 2515(J)

Chlorine isotopes Cl^{39}

mass, determination of best value, 9: 3283(J)

Chlorine oxyfluorides

preparation of, from alkali chlorates and BrF_3, 9: 2187(J)

Chloroform

bonding of D-labeled, in various solvents, quantitative study by infrared spectrometry, 9: 3060(J)

preparation of D-labeled, 9: 3060(J)

radiosensitivity in dosimeters, 9: 4242(R)

radiosensitivity of mixture of tetrachloroethylene and, 9: 4241(R)

Chlorophylls

biosynthesis of C^{14}-labeled, 9: 2105(J)

new tautomer of, with spectrum similar to chlorophyll-b, 9: 873(J)

Choline analogs

effects of high-energy electrons and gamma radiation on, 9: 2198

radiation decomposition, 9: 2136(R)

Choline chloride

radiation decomposition, 9: 2136(R)

Cholinergic drugs

protective effects of, against radiation injuries, 9: 2548(R)

Cholinesterase

metabolism of, in brains of rats, 9: 61(R)

Chromatographic analysis

paper, application to geochemical prospecting, 9: 3404(J)

Chromatographic separations

combined with specific-activity determination in determinations of radiochemical purity, 9: 3262(J)

of inorganic cations, 9: 1483(J)

of spallation products of Cu, 9: 1485(J)

Chromatography

(See also Electrochromatography.)

automatic scanner for, design, 9: 1484(J)

differential spectrophotometric measurements of reflectance in, 9: 3395(J)

gas, separation and analysis of gases, and volatile liquids by, 9: 2672(J)

of labeled compounds, performance of a 4π β counter for scanning, 9: 3263(J)

paper, manual, 9: 3076(J)

rare earth separation, partition, and transition-element separation on paper impregnated with ion-exchange resins, 9: 3108(J)

recording integrating photoelectric and radioactive scanners, 9: 2393(J)

Chromel

(See Chromium–nickel alloys.)

Chromium

determination in Fe alloys, 9: 1901(R)

deuteron excitation cross sections, 9: 2331(R)

electrodeposition on motorettes, procedure for, 9: 1554(R)

electroforming from Unichrome CR-110 and chromic acid baths, 9: 3495

electroplating and roll-bonding to Ti, 9: 3477(R)

melting, forging, swaging, and rolling, 9: 2326(J)

neutron scattering and γ rays from inelastically scattered neutrons, 9: 3993(R)

preparation of, by electrolysis of chromic acid, 9: 2326(J)

radiochemical determination, 9: 876

reaction with fused NaOH, 9: 1466(R)

spectrographic determination in Bi, 9: 1475

spectrographic determination in Ti and Ti alloys, 9: 639(R)

spectrographic determination of, in ores and rocks, 9: 162

spectrophotometric determination of, by EDTA complex formation, 9: 4086(J)

x-ray spectra (soft), 9: 452(J)

Chromium alloys

casting and forging for gas turbine application, 9: 3869

corrosion in water and aqueous media at 600 and 680°F, 9: 1822

vacuum fusion analysis, 9: 2724

Chromium–aluminum–manganese compounds (intermetallic)

crystal structure, 9: 2373(J)

Chromium–aluminum–molybdenum–titanium alloys

phase structures and tensile properties of as-produced, 9: 2279(R)

Chromium–aluminum–nickel–titanium alloys

surface chemistry of oxidized, 9: 2747(J)

Chromium–aluminum oxide compacts

vibratory compacting, 9: 4173(R)

Chromium–aluminum–titanium alloys

effects of heat treatment on elevated-temperature tensile properties and microstructure, 9: 2719(R)

Chromium–aluminum–titanium alloys (cont'd)

fabrication, 9: 1534

fabrication and physical properties, 9: 2717(R)

hardness, crystal structure, and phase studies, 9: 3520

hardness, heat treatment, and microstructure, 9: 4186

impact strength and hardness of weld thermal-cycled heat-affected zone of, 9: 1531

microstructure and continuous cooling transformation of, 9: 1531

Chromium borides

metallurgical properties, survey, 9: 3822(J)

properties of, effect of molten Ti on, 9: 2248

Chromium–boron–molybdenum systems

physical properties, 9: 150(R)

Chromium–boron–nickel systems

hardness measurements, 9: 3822(J)

properties of, as high temperature brazing alloy for thin sheet metals, 9: 1886(J)

Chromium–boron systems

physical properties, 9: 150(J)

Chromium–chromium–titanium alloy couples

diffusion coefficients, 9: 2739

Chromium–cobalt alloys

neutron diffraction studies of magnetic structure of, 9: 2312(J)

Chromium–cobalt–iron–nickel alloys

analysis of, using anion-exchange separations, 9: 1544(J)

weldability of wrought, 9: 3530(J)

Chromium–cobalt–nickel alloys

static, fatigue, and mechanical properties of wrought N-155 alloy at elevated temperatures, 9: 4170

Chromium–cobalt–nickel–tungsten alloys

preparation, fabrication, density, tensile properties, microstructure, hardness, and temperature effects of aged and sintered X-40 compacts, 9: 3173

weldability of wrought, 9: 3530(J)

Chromium complexes

with 1,10-phenanthroline, 2,2′-bipyridine, and 2,2′,2″-terpyridine, preparation and chemical properties, 9: 512

Chromium ions

spectrophotometric determination of Cr^{+3} by disodium salt of (ethylenediamine) tetraacetic acid, 9: 3075(J)

Chromium–iron alloys

creep, heat treatment, and tensile properties, 9: 2724

dilatometric determination of $\alpha \rightleftharpoons \sigma$ transformation, 9: 3537(J)

forgeable high-strength, high-temperature, preparation of, effects of additives, 9: 3522

neutron diffraction studies of magnetic structure of, 9: 2312(J)

Chromium–iron–manganese–molybdenum–titanium alloys

mechanical properties and microstructure of extruded and heat treated, effects of temperature, pressure, and die angle on, 9: 2276(R)

Chromium–iron–manganese–molybdenum–titanium–vanadium alloys

heat treatment, mechanical properties, phase studies, tensile properties, and welding, 9: 2298

tensile properties, hardness, and flash weldability, 9: 3856

Chromium–iron–molybdenum–nickel alloys

tensile properties, creep-rupture at 1350 and 1500°F, and microstructure, 9: 3859

Chromium–iron–molybdenum–titanium alloys

tensile properties and ductility, 9: 1848(R)

Chromium–iron–nickel alloys

vacuum melting and casting, 9: 2727(R)

Chromium–iron–titanium alloys

creep of heat-treated and as-received, at 76 and 600°F, 9: 3478(R)

creep of hot-rolled and annealed, at 76 and 600°F, aging effects on, 9: 3479(R)

creep of Ti 150A, 9: 168(R)

drilling tests, 9: 3544(J)

effects of creep testing on room-temperature tensile properties of heat-treated and hot-rolled, 9: 2279(R)

machining and grinding, 9: 4174

machining characteristics of forged Ti-150A, 9: 4168

tensile properties and rupture at 800°F of hot-rolled, 9: 2275(R)

tensile properties at room temperature, effects of creep test conditions on, 9: 2275(R)

Chromium isotopes

stable, concentration by electromagnetic process, 9: 2404

Chromium isotopes Cr^{51}

decay, 9: 3687(J)

as a label for red blood cells, 9: 3049(J)

toxicology of, for cattle, 9: 1156(R)

Chromium isotopes Cr^{52}

angular correlations, 9: 1067(R)

Chromium isotopes Cr^{54}

decay and energy levels, 9: 748(J)

Chromium–manganese–molybdenum–titanium alloys

microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296

Chromium–manganese–titanium alloys

grain structure, hardness, heat treatment, mechanical properties, phase studies, and welding, 9: 2298

Chromium–molybdenum–nickel alloys

oxidation at 950°C, 9: 3146

weldability of wrought, 9: 3530(J)

Chromium–molybdenum–nickel–tungsten alloys

compressive-stress-rupture properties of high-temperature, 9: 3503(R)

Chromium–molybdenum–titanium alloys

mechanical properties of, effects of grain size and heat treatment on, 9: 3492(R)

mechanical properties of, effects of grain size on, 9: 1837(R)

Chromium–molybdenum–titanium boride systems

refractory properties, 9: 4137(R)

Chromium–nickel alloys

constitution diagrams, Cr rich portion of, 9: 1876(J)

magnetization, theory and measurement, 9: 4209

oxidation at high temperatures, mechanism of, 9: 2325(J)

resistance sintering under pressure, 9: 1878(J)

specific heat and enthalpy, 9: 2308(J)

Chromium–nickel steel

isothermal embrittlement in, during tempering from 800°F to lower critical temperature, 9: 4188

oxidation, 9: 949

Chromium nitrides

electrical resistance of films of, 9: 2345(J)

Chromium–nitrogen–titanium systems

electrical resistance of films of, 9: 2345(J)

Chromium oxides

heat and free energy of formation, 9: 529(J)

Chromium–oxygen systems

isotopic equilibration determination of O in, 9: 3394

Chromium–oxygen–titanium systems

phase studies, 9: 1874(J)

Chromium phosphates

colloidal, labeled with P^{32}, use in measurements of blood flow in liver, 9: 2609

colloidal, tissue distribution in rats, tracer study, 9: 1725(J)

Chromium–silicon systems

preparation, corrosion, physical properties, and testing, 9: 2740

Chromium steel

effect of current, voltage, and speed travel on welds in, 9: 218(J)

embrittlement of, effect of time and temperature range of 800 to 1200°F on, 9: 2758(J)

intercrystalline corrosion, due to aging, 9: 4143(J)

isothermal embrittlement in, during tempering from 800°F to lower critical temperature, 9: 4188

oxidation, 9: 949

properties of, at elevated temperatures, 9: 3883(J)

spheroidize annealing, 9: 194(J)

submerged arc welding of, 9: 218(J)

tensile strength of spheroidize annealed, 9: 194(J)

Chromium–titanium alloys

effects of heat treatment on elevated-temperature tensile properties and microstructure, 9: 2719(R)

fabrication, 9: 2326(J)

grain boundary diffusion in, as bonding agent between Ti and steel, 9: 4182

hardness, heat treatment, and microstructure, 9: 4186

hardness and phase studies, 9: 1844(R)

phase structure and tensile properties of as-forged and heat-treated, 9: 2279(R)

preparation, corrosion, physical properties, and testing, 9: 2740

tensile properties, 9: 3486(R)

x-ray density as a function of Cr and oxidation as a function of density and composition, 9: 3841(R)

Chromium–titanium compounds (intermetallic)

powder preparation, microstructure, and x-ray diffraction patterns, 9: 3841(R)

Chromium–titanium couples

diffusion coefficients, 9: 2739

Chromium–titanium–vanadium alloys

constitution diagrams and mechanical properties, 9: 4187

hardness, heat treatment, mechanical properties, phase studies, and welding, 9: 2298

Chromium–tungsten alloys

fabrication, 9: 2326(J)

Chromium–uranium alloys

phase studies, 9: 2726

thermal conductivity at 70°C, 9: 1879(J)

Chromium–zirconium alloys

creep-rupture, 9: 190(R)

preferred orientation of cold-rolled and cold-rolled and annealed, 9: 3180(R)

preparation and fabrication, 9: 3179

tensile properties of, from −195 to 500°C, 9: 3180(R)

tensile properties of, from −195 to 500°C, particle-strengthening effects on, 9: 3179

Chromium yttrium oxides

preparation and crystal structure, 9: 905(J)

Chromosomes

breakage of, in Tradescantia with Ca deficiencies, 9: 3006(J)

duplication, x-ray analysis of, 9: 3027(J)

Chromosomes (cont'd)
effects of irradiation with thermal neutrons and x radiation on aberrations and rejoining of, in Trillium, 9: 476
effects of pre- and post-irradiation centrifugation on, of Tradescantia and Vicia, 9: 842(J)
effects of radiation on, in Drosophila, 9: 3021(J), 3023(J)
effects of radiation on, in grasshopper neuroblasts, 9: 2575(J)
effects of x and ultraviolet radiation on, in tomatoes, 9: 1451(J)
radioinduced aberrations in, effects of various radiation dosages, air and nitrogen on, in Tradescantia, 9: 3020(J)
radioinduced aberrations in, in Tradescantia microspores, 9: 835(J)
radioinduced breakage in, in Tradescantia, 9: 823(J), 2576(J)
radioinduced breakage of, rejoining capacity with respect to thermal neutrons and x radiation in Trillium, 9: 1154
radiosensitivity of, in Tradescantia microspores, 9: 2099(R)

Chugwater Formation (Wyo.)
geology, 9: 956(J)

Chuska Mountains Area (Ariz.)
geophysical exploration, 9: 2709

Circle Cliffs Quadrangle (Utah)
photogeologic map of, 9: 4147(J), 4148(J), 4149(J)

Circle Hot Springs Area (Alaska)
geology, 9: 628(J)

Circuits
(See also Coincidence circuits; Feedback systems, Timing circuits.)
control, for ultra-high vacuum gages, 9: 282(J)
decade-scaler voltage converter for automatic plotting, design, 9: 3242
design and performance, 9: 1282
design of trigger, for automatic coulometric titrations, 9: 101(J)
design of, with high input impedance for measurement of cellular electrophysiological response, 9: 274
matrix analysis of 4-arm bridges, 9: 4206
mixing preamplifier, for minimum of signal attenuation, 9: 281(J)

Citrate complexes
formation with alkaline earths, anion exchange studies of, 9: 2213(J)
properties of cerium(III), in aqueous and 50% alcohol solutions, 9: 3794

Civilian defense
atomic bomb direction locator, 9: 1437(P)
effects of environment on reducing dose rates from fall-out, 9: 2590
photographic roll film from local drugstores for radiation survey following atomic disaster, 9: 698
safety and lethal effects of atomic explosions, 9: 469(J)

Clancey Mining District (Mont.)
exploration, geology, mineralogy and U-bearing deposits in, 9: 1518(J)

Clark Mountain Mining District (Calif.)
geology, 9: 2708

Clays
absorption of γ-active Co, La, and Ce-Pr by commercially available, 9: 658
exchange between D_2O and, 9: 2648(J)
flocculation, 9: 50

Cleaning
ultrasonic, of hot metallographic samples, 9: 567(J)

Clem Mountain Area (Alaska)
uranium distribution in, 9: 1523(J)

Cliff Canyon Claim (Ariz.)
mineralogy, 9: 1829

Clothing
(See also Textiles.)
cotton, decontamination of, evaluation of laundering agents and techniques for, 9: 1704

Cloud chambers
atlas of typical expansion chamber photographs, 9: 3254(J)
continuous diffusion, design, 9: 316(J)
continuous diffusion type, automatic registration of tracks in and working conditions of, 9: 1048(J)
design and performance of 36-atm. diffusion, for use with cyclotron and bevatron, 9: 3253
design of automatic, 9: 315(J)
detector system for automatic control, 9: 2865(J)
diffusion, improvements in, 9: 1609(J)
high-pressure, events observed in high-altitude operation, 9: 3563(J)
magnetic, coil design, 9: 2862(J)
magnetic, design, 9: 2808
magnetic, x-ray beam measurement of distortion in, 9: 3596(J)
method for estimating distortion of tracks in, 9: 2421(J)
particle mass determination by deflection in metal plates in, 9: 3327(J)
rubber diaphragm, improvement in, 9: 1603(J)
time analysis of Wilson cloud chamber expansions, 9: 1612(J)
turbulence reduction by cutting and thermal isolation of metallic absorbers, 9: 2867(J)
window holder design for, 9: 1055(J)

Clouds
radioactivity after atomic explosions, in France, 9: 2536(J)

Coal deposits
mineralogy, 9: 1827(R)

Coal deposits (Ind.)
occurrence, analysis, 9: 1515

Coal deposits (Wyo.)
occurrence, 9: 2263

Coatings
(See also specific coatings identified by material, e.g., Ceramic coatings; Metal coatings.)
metallic, radioautographic inspection, 9: 147
moisture penetration determination by tritium, 9: 2784(J)
operating characteristics of water glass, shellac, paraffin, and lacquer waterproofing, on electrodes in underwater metallic arc welding, 9: 2316(J)
protective, for metals, book on, 9: 4144(J)
thin alpha-active, radiometric thickness gage for, 9: 1236
of Ti and Ti alloys with Mo, 9: 2752(J)

Cobalt
absorption of β particles in, and relation to surface counting for diffusion measurements, 9: 4000(J)
absorption on clay as simulants for contaminants for nuclear detonations in harbors, 9: 658
chromatographic determination of, in soil samples, 9: 3404(J)
colorimetric determination of, in alloy steels by the tetraphenylarsonium method, 9: 2162
determination in U by ion exchange, 9: 884(J), 1793(J)
determination of, in high-temperature alloys using anion-exchange separations, 9: 1544(J)
diffusion of, in Mo, 9: 1276(J)
effects of, on radiosensitivity of phosphate glass, 9: 1040
influence on diffusion of C in C–Fe systems, 9: 1869(J)
liquid-liquid extraction from Zn, 9: 1224(J)

Cobalt (cont'd)

oxidation rate of, tracer study, 9: 2759(J)

quantitative determination of divalent, using a high-frequency oscillator and ethylenediaminetetraacetic acid, 9: 2169(J)

radiochemical determination, 9: 676

spectrographic determination in Ti and Ti alloys, 9: 639(R)

spectrographic determination of, in ores and rocks, 9: 162

spectrophotometric determination of, by EDTA complex formation, 9: 4086(J)

x-ray spectra (soft), 9: 452(J)

Cobalt alloys

with carbon, Si, Mn, Cr, Nb, Ni, Co, Fe, W, Mo, and N, preparation and properties, 9: 3488(R)

casting and forging for gas turbine application, 9: 3869

compression-creep properties, 9: 3504(R)

compressive-stress-rupture properties of high temperature, 9: 3503(R)

corrosion in high-temperature waters, 9: 3459

resistance sintering under pressure, 9: 1878(J)

rupture tests on wrought S-816 and U-912, and rupture and tensile strengths of Vitallium, 9: 2720(R)

Cobalt–aluminum–molybdenum alloys

oxidation at 954°C, 9: 3146

Cobalt–beryllium–copper–zinc alloys

mechanical properties, 9: 3509

Cobalt–carbon–iron systems

diffusion of C in, influence of Co, 9: 1869(J)

Cobalt chelates

with 2,4-pentanedione, formation constants, enthalpy and entropy, 9: 3390(J)

Cobalt–chromium alloys

neutron-diffraction studies of magnetic structure of, 9: 2312(J)

Cobalt–chromium–iron–nickel alloys

analysis of, using anion-exchange separations, 9: 1544(J)

weldability of wrought, 9: 3530(J)

Cobalt–chromium–nickel alloys

static, fatigue, and mechanical properties of wrought N-155 alloy at elevated temperatures, 9: 4170

Cobalt–chromium–nickel–tungsten alloys

preparation, fabrication, density, tensile properties, microstructure, hardness, and temperature effects of aged and sintered X-40 compacts, 9: 3173

weldability of wrought, 9: 3530(J)

Cobalt complexes

ammoniacal, H_2 high-temperature, high-pressure reduction, design and performance of equipment for, 9: 1181

with o-phenanthroline and sulfonated oxine, electrodeposition from aqueous solutions of, electronic configuration in, 9: 2625(J)

with 2,2',2''-terpyridine, colorimetric determination, 9: 512

Cobalt(II) fluorides

crystal structure, 9: 92(J)

Cobalt glass

in measurement of high doses of γ radiation, 9: 3932

Cobalt ions

equilibrium formation constants for reaction in aqueous solution of acetylacetonate ion with, 9: 1752(J)

separation by ion exchange, 9: 910(J)

solvent extraction, 9: 3111(R)

Cobalt isotopes Co^{56}

separation of, from Mn target by complexing with α-nitroso-β-naphthol, 9: 119(J)

Cobalt isotopes Co^{57}

decay scheme, 9: 4326(J)

disintegration, 9: 2973(J)

separation of, from Mn target by complexing with α-nitroso-β-naphthol, 9: 119(J)

Cobalt isotopes Co^{58}

formation of, and use for the preparation of labeled vitamin B_{12}, 9: 1177(J)

separation of, from Mn target by complexing with α-nitroso-β-naphthol, 9: 119(J)

Cobalt isotopes Co^{59}

deuteron reactions (d,p), magnetic analysis of, 9: 1089(J)

proton reactions of, at 60, 100, 170, and 240 Mev, 9: 1091(J)

Cobalt isotopes Co^{60}

absolute measurement of γ radiation from, 9: 1978(J)

beta decay, lifetimes of excited states of Ni^{60} following, 9: 2509(J)

design of γ source containing, 9: 3923

gamma emission, energy measurement by secondary electron absorption, 9: 809(J)

as gamma source, calibration, 9: 271

as gamma source in a 100-c irradiator, 9: 3896(J)

as a gamma source for interstitial, intracavitary, and plaque application in radiotherapy, 9: 843(J)

as a gamma source in a teletherapy unit, 9: 497(J)

half life, 9: 2960(J)

high dose rate source for small specimens, design, 9: 2067(J)

measurement of integral dose of γ radiation from teletherapy beam of, 9: 1979(J)

protection against radiation from, handbook, 9: 1452(J)

retention in vitamin B_{12}, 9: 2104(J)

rotating teletherapy unit containing, dose distribution and protection requirements, 9: 1726(J)

teletherapy unit using, electron filter to improve localization of γ beam, 9: 3040(J)

therapeutic applications to cancer, 9: 1174(J)

therapeutic use of, for bronchial carcinoma, 9: 1163(J)

use in radiotherapy, slide rule nomograms for, 9: 3042(J)

used in a beam therapy unit, scattered radiation from, 9: 2129(J)

as a well-defined γ-beam, conversion of a radium beam unit for housing, 9: 2125(J), 2126(J)

Cobalt–manganese–molybdenum alloys

oxidation at 940°C, 9: 3146

Cobalt molybdates

crystal structure and x-ray-diffraction patterns, 9: 3146

phase transformation and spalling in, effect of oxide addition on, 9: 3146

Cobalt–molybdenum alloys

creep-rupture strength of, 9: 633

oxidation testing at 940°C, 9: 3146

Cobalt–molybdenum–nickel–tungsten alloys

compression-creep properties, 9: 3504(R)

Cobalt–molybdenum–silicon systems

oxidation at 945 ± 10°C, 9: 3146

Cobalt–nickel–uranium alloys

pseudo-binary phase sections between Laves phases in, 9: 3353(J)

Cobalt oxides

heat and free energy of formation, 9: 529(J)

Cobalt–platinum alloys

thermodynamic properties, 9: 2294(R)

Cobalt systems

mechanical properties of Co oxide cermets, 9: 4139(R)

Cobalt–titanium alloys

grain boundary diffusion in, as bonding agent between Ti and steel, 9: 4182

Cobalt–titanium compounds (intermetallic)

powder preparation, microstructure, and x-ray-diffraction patterns, 9: 3841(R)

Cobalt–tungsten carbide systems

resistance sintering under pressure, 9: 1878(J)

strength, composition, and grain size of sintered, 9: 2755(J)

Cobb Chemical Lab., Univ. of Va.

progress reports on evaluation of high temperature antioxidants for synthetic base oils, 9: 4115(R)

Cockcroft-Walton accelerators

auxiliaries, 9: 1654(J)

for pulsable neutron generators, design, 9: 3307(J)

Codeine

oxidation by Ag carbonate for preparation of codeinone, 9: 59

Codeinone

preparation by Ag carbonate oxidation of codeine, 9: 59

synthesis of, from codeine in benzene solution and Ag_2CO_3, 9: 61(R)

Coffinites

description, 9: 3838(J)

Coincidence circuits

design of cosmic shower selecting, 9: 3560(J)

design of fast response, 9: 3941(J)

fast, for high-energy particles, design, 9: 2416

photomultiplier tubes in high-speed, prevention of high-voltage breakdown of, 9: 1026(J)

Coke

crystal structure and mechanical properties, 9: 91

structure and graphitization, 9: 262

Colchicine

effects of, on cell division of hematopoietic cells of tadpoles, 9: 1448(J)

Colfax Sill Area (N. Mex.)

exploration of, U distribution, 9: 955(J)

Collagen

microstructure, and effects of Ca and pathologic conditions on, in tails and tendons, 9: 3(R)

Collodion

energy loss of 22-kev electrons, 9: 1665(J)

Colloids

(See also Aerosols; Drops; Silicon oxides (colloidal); Smokes.)

light scattering functions for spherical particles of, tables, 9: 4299

preparation and properties of, using Po^{210}, 9: 62

properties of, review, 9: 3063(J)

Colorado

mineral association in U deposits, 9: 1829

mineral investigations field studies map of Egnar Quadrangle in, 9: 4152(J)

mineral investigations field studies map of Hamm Canyon Quadrangle in, 9: 4150(J)

mineral investigations field studies map of Paradox Quadrangle in, 9: 4151(J)

preliminary geologic map of Calamity Mesa Quadrangle in, 9: 4155(J)

preliminary geologic map of Davis Mesa Quadrangle in, 9: 4154(J)

preliminary geologic map of Gypsum Gap Quadrangle in, 9: 3470(J)

preliminary geologic map of Joe Davis Hill Quadrangle in, 9: 4153(J)

Colorado (Gunnison Co.)

general geology of the Quartz Creek Pegmatite District in, 9: 4156(J)

Colorado (Larimer Co.)

pegmatite deposits of the Crystal Mountain District in, 9: 3157(J)

Colorado (Montrose Co.)

exploration of Wray Mesa in, 9: 1513

Colorado Plateau

exploration, 9: 1514

geologic map showing U distribution and ore-bearing formations of, 9: 2271(J)

mineralogy, uranium distribution, 9: 1829

statistical analysis of contract drilling on, 9: 624

Colorado Univ.

progress reports on luminescence spectra of organic compounds, 9: 3759(R)

Colorimetric analysis

automatic equipment for, 9: 1765(J)

determination of metal ions by annular oven method and spot testing, 9: 3781

Columbia Radiation Lab., Columbia Univ.

progress reports, 9: 731(R)

Columbia Univ.

progress reports on genetic studies, 9: 5(R)

Columbia Univ. School of Mines

progress reports on study of diffusionless phase changes in solid metals and alloys, 9: 1861(R)

Column packing

(See also Distillation apparatus; Extraction apparatus.)

design of, for distillation columns, 9: 4097(J)

Combustion

equipment, electric heater for, 9: 1211

of mixture of gases, effects of β radiation on, 9: 1550(R)

rapid, of metals in air, literature survey, 9: 3178

Combustion analysis

of compounds labeled with isotopes of C and H, 9: 2180(J)

degradation of C^{14}-labeled compounds using a combined combustion-diffusion vessel, 9: 2178(J)

design and calibration of an automatic micromuffle for determination of ash in carbonaceous material, 9: 3398(J)

Compacts

(See also specific compacts, e.g., Aluminum oxide compacts.)

vibratory compacting, 9: 4173(R)

Compounds

binary, slide rule for converting atomic percent to weight percent, design and performance, 9: 3170

Compressible flow

(See also Gas flow; Incompressible flow.)

coefficient of resistance in, at near sonic velocities, 9: 2233(J)

equations, tables, and charts for, 9: 1245(J)

viscous mixing of parallel streams of different velocity and temperature, theoretical analysis, 9: 4130

Compton effect

time delay in, measurement, 9: 4002(J)

Computers

(Calculating devices, mechanical and electrical; see also Mathematics; Memory devices; Mercury delay lines; Reactor simulators.)

application to chemistry and chemical engineering, review, 9: 3249(J)

Computers (cont'd)

Bessel functions programming, 9: 1596

bibliography on, 9: 2828, 2829

bibliography on data storage and recording, 9: 3207

design and operation of ORACLE, 9: 4237

electric analogs for solution of heat transfer equations, 9: 2232(J), 3451(J)

magnetic drum memory systems for electronic, survey, 9: 1018

manual for Maniac, 9: 692

mechanical calculator for background correction in spectrographic analysis, 9: 4087(J)

memory circuits for digital, 9: 2410

solutions of chemical engineering problems by means of, 9: 3387(J)

test and monitor equipment, 9: 2409

theory, design, and performance of a Rachinger conversion slide rule for conversion of atomic weight percent for binary alloys and compounds, 9: 3170

three-dimensional analog, operation of, 9: 1021(J)

use of high-speed digital, for direct determination of crystal structures, 9: 2817(J)

Concretes

(See also Cements.)

attenuation of broad beam 70 to 250 kvp x radiation by, 9: 2046(J)

cosmic-ray attenuation length in, 9: 676(J)

radon release in radiant heating, 9: 2066

spectral and angular distributions of secondary γ rays from source imbedded in, 9: 2490(J)

stress in, gages for measurement of, 9: 2830

Conductometric analysis

equipment for, of nitric acid–nitrogen oxide systems, 9: 75

large volume cell for, design, 9: 4094

Connective tissue

physiologic and histochemical changes in, induced by total-body irradiation in rats, 9: 492(J)

preparation of, for electron microscopy, 9: 1707(J)

Connolly Creek Area (Alaska)

uranium distribution in, 9: 1523(J)

Consolidated Vultee Aircraft Corp.

progress reports on metal adhesives, 9: 4114(R)

Constants and conversion factors

(Includes only miscellaneous constants not covered specifically elsewhere.)

theory, design, and performance of a Rachinger conversion slide rule for conversion of atomic to weight percent for binary alloys and compounds, 9: 3170

Control systems

(See Electric control systems.)

Continental Oil Co.

progress reports on development and evaluation of a grease for −100 to +350°F, 9: 2690(R)

Convection

(See also Heat Transfer.)

thermal, in long cell containing a heat-generating fluid, 9: 4128

Convection (forced)

heat transfer by, in laminar flow, 9: 2229

Convection (free)

heat transfer by, from heating surface to boiling liquid, 9: 1810(J)

heat transfer by, in laminar flow, 9: 2229

heat transfer by, in vertical tube closed at bottom, 9: 1805

Convection (free) (cont'd)

heat transfer from circular finned cylinders by, 9: 1808

laminar flow analyses for, in fluids having a volume heat source, 9: 1492

Conveyers

vibrating, movement of material on, mathematical analysis, 9: 2789

Cook Research Labs. Div., Cook Electric Co.

progress reports on pressure elements utilizing pressure-sensitive transistors, 9: 3547(R)

Copper

adsorption of aliphatic compounds on, from aqueous solutions as inferred from H_2 overvoltage measurements, 9: 595(J)

absorption of cosmic μ mesons, 9: 721

adsorption of O_2 on evaporated films of, 9: 2159(J)

brazing of, with B–Ni–Cr systems, 9: 1886(J)

bremsstrahlung reactions at 320 Mev, interpretation of results, 9: 3654(J)

bremsstrahlung reactions at 320 Mev, nuclide yields from, 9: 3653(J)

chromatographic determination of, in soil samples, 9: 3404(J)

continuous ion exchange with an endless belt of phosphorylated cotton, 9: 3104(J)

corrosion by chlorinated and alkalized boiler water and pure deionized water, 9: 3168

corrosion by hydraulic fluids, 9: 2795(R)

corrosion of, by HCl, kinetics, 9: 2251

corrosion of, by wet and dry Cl_2 between 260 and 300°, 9: 158(J)

corrosion testing, methods for cleaning exposed specimens for, 9: 953(J)

cross sections for neutron transmission and multiplication, 9: 3646(J)

detection of inclusions of, in Al by colorimetric spot tests, 9: 1196

determination in U by ion exchange, 9: 884(J), 1793(J)

dissolution of, in nitric acid and in ferric chloride, effects of turbulent flow, 9: 3448(J)

effects of cold deformation on Young's modulus of, 9: 2769(J)

effects of H on during electrolytic pickling, 9: 1272(J)

effects of 12-Mev deuterons on, near 10°K, 9: 2946(J)

elastic spectrum of, from temperature-diffuse scattering of x rays, 9: 2802(J)

electrodeposition, effect of Li ions, 9: 1195(J)

electroforming from fluoborate, acid sulfate, Unichrome C-10X, and Wes-X cyanide baths, 9: 3495

electron and positron absorption in, 9: 415(J)

emission of secondary electrons (δ rays) by 1.3-Mev electron bombardment, 9: 1306(J)

energy loss of secondary electrons in a cavity with walls of, 9: 2045(J)

gamma reactions (γ,n), 9: 1358(J)

growth of plastic deformation in, 9: 177

lattice defects and electrical resistivity in cold-worked and irradiated, 9: 2330

neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)

neutron reactions $(n,n\gamma)$, γ yields and energies from, 9: 4204(R)

nuclear magnetic moments, 9: 2895

number of vacancies and energy of vacancy formation in, 9: 3525(J)

oxidation, isotope effect of O^{18} in, 9: 850

oxidation of, under conditions of linear temperature increase, 9: 181

periodic potential solutions for the solid state, 9: 231(R)

photon scattering cross section, 9: 4205(R)

photoneutron yield, measurement with NaI crystal, 9: 3944(J)

photonuclear reactions, 9: 2449(J)

polarization of, in 3% NaCl solution, 9: 2259(J)

Copper (cont'd)
polarographic behavior and electrodeposition, 9: 519
polishing of, with alumina abrasives, technique, 9: 3879(J)
pressure-compression date for, from shock wave measurements, 9: 3876(J)
production, fabrication, metallurgy, prpperties and corrosion, review, 9: 2300(J)
proton reactions (p,n), angular distributions and yields at 23 Mev, 9: 4290(J)
proton stopping cross section, 9: 2026(J)
quantitative determination of divalent, using a high-frequency oscillator and ethylenediaminetetraacetic acid, 9: 2169(J)
radiometric determination, 9: 2634
reaction with fused NaOH, 9: 1466(R)
sample preparation from arsenic target for counting, 9: 2676(J)
self-diffusion coefficient, 9: 1278(J)
shear modulus of irradiated and cold-worked wires, effect of annealing, 9: 2330
slowing down of polarized protons by, 9: 2039(J)
spallation products of, with 60-Mev protons, chromatographic separation of, 9: 1485(J)
spectrographic determination of, in ores and rocks, 9: 162
stress values of, chart and nomograph for, 9: 3441(J)
three-quantum annihilation of positrons in, 9: 249(J)
wetting by liquid Na, 9: 229(J)
x-ray spectra (soft), 9: 452(J)

Copper alloys
corrosion testing, methods for cleaning exposed specimens for, 9: 952(J)
fabrication, metallurgy, properties, and corrosion, review, 9: 2300(J)
fatigue and stress, 9: 4159
nuclear magnetic moments, 9: 2895
polarization of, in 3% NaCl solution, 9: 2259(J)
polishing of, with alumina abrasives, technique, 9: 3879(J)

Copper–aluminum alloys
creep of, effects of structure on, at high temperature, 9: 2732
creep of, grain-boundary movement, slip, and fragmentation during, 9: 2321(J)
electrolytic polishing, 9: 4189(J)
intercrystalline corrosion, due to aging, 9: 4143(J)
intercrystalline grains in growth of, determined by the method of microhardness, 9: 642(J)
magnetic susceptibility and change of state on tempering, 9: 4192(J)
relaxation effects in solid solutions of, arising from changes in local order, 9: 204(J)
relaxation strength, 9: 1537(J)

Copper–aluminum couples
preparation and grain-boundary diffusion, 9: 971(R)

Copper–aluminum–magnesium alloys
aging characteristics, 9: 2323(J)

Copper–aluminum–magnesium–manganese alloys
effects of heat treatment on corrosion, 9: 4143(J)
exaggerated grain growth of extruded, 9: 1545(J)

Copper–aluminum–nickel alloys
diffusionless phase transformation, crystal structure, heat treatment, and thermal expansion, 9: 1861(R)

Copper–aluminum–silicon systems
corrosion resistance and mechanical properties of, effects of variation of zinc content on, 9: 3541(J)
effects of vibration on solidifications, 9: 3851

Copper–aluminum–zinc alloys
spiral formation in β phase, 9: 1882(J)
spiral substructures in β phase, 9: 1881(J)

Copper arsenides
electric conductivity, 9: 1467(R)

Copper–beryllium alloys
alloying effect of Be on properties of, 9: 982(J)
corrosion by hydraulic fluids, 9: 2795(R)
heat treatment in a 60-kev horizontal furnace, 9: 1891(J)
phase studies, 9: 2748(J)

Copper–beryllium–cobalt–zinc alloys
mechanical properties, 9: 3509

Copper bromides
viscosity and electrical conductivity relationship in solutions of, 9: 1748(J)

Copper–calcium compounds (intermetallic)
crystal structure, 9: 683(J)

Copper chelates
chemical properties of, 9: 512
with 2,4-pentanedione, formation constants, enthalpy, and entropy, 9: 3390(J)

Copper chloride–potassium chloride systems (liquid)
electric conductivity, 9: 2139(J)

Copper complexes
with o-phenanthroline, sulfonated oxine, and dimethylglyoxime, electrodeposition from aqueous solutions of, electronic configuration in, 9: 2625(J)
with 1,10-phenanthroline, chemical properties, 9: 512

Copper crystals
electroplating of, with Cu, 9: 519
grain-boundary diffusion of Ag in, anisotropy of, 9: 1285(J)

Copper films
x-ray-diffraction analysis of surface properties, 9: 186

Copper–gold alloys
electrolytic polishing, etching, and grain structure, 9: 2765(J)

Copper–gold alloys (liquid)
thermodynamic properties, 9: 188(R)

Copper–gold compounds (intermetallic)
energy relations in, colorimetric investigation of, 9: 2764(J)
ordered, electron diffraction study of, 9: 205(J)

Copper ions
adsorption of, on sphalerite, effect of ammonia concentration, 9: 623(R)
adsorption of, on sphalerite and NaCN, 9: 3111(R)
equilibrium formation constants for reaction in aqueous solution of acetylacetonate ion with, 9: 1752(J)

Copper isotopes Cu^{62}
gamma spectrum and its relation to mass measurements, 9: 2964(J)

Copper isotopes Cu^{63}
nuclear magnetic resonance of, at 299 and 77°K, 9: 61(R)
proton reactions (p,n), 9: 1067(R)

Copper isotopes Cu^{64}
half life, 9: 2960(J)

Copper isotopes Cu^{65}
nuclear magnetic resonance of, at 299 and 77°K, 9: 61(R)
proton reactions (p,n), 9: 1067(R)

Copper–lanthanum compounds (intermetallic)
crystal structure, 9: 683(J)

Copper–nickel alloys

corrosion by chlorinated and alkalized boiler water and pure deionized water, 9: 3168

corrosion in high-temperature waters, 9: 3459

magnetic and thermal properties, theory and measurement, 9: 4209

tensile properties of commercial and high-purity, effect of temperature on, 9: 2309(J)

welded joints of, with stainless steel, thermal rupture, 9: 1264

Copper–nickel couples

diffusion in, effects on cross section area, 9: 3526(J)

diffusion processes in, 9: 4191(J)

Copper oxides

heat and free energy of formation, 9: 529(J)

isotopic equilibration determination of O in, 9: 3394

photo-electromotive forces in, 9: 3761

solution in H_2SO_4, mechanism of, 9: 849

Copper–oxygen systems

isotopic equilibration determination of O in, 9: 3394

Copper–palladium alloys

constitution diagrams, crystal structure, heat treatment, physical properties, and preparation, 9: 3174

Copper–platinum alloys

thermodynamic properties, 9: 2294(R)

Copper powders

sintering of, porosity and permeability changes during, 9: 3534(J)

Copper selenides

electric properties, 9: 4266(R)

resistivity, 9: 1994(R)

Copper–silicon crystals

radiation effects in, x-ray diffraction analysis, 9: 2496

Copper–silicon systems

galling and seizing of, by friction coefficients, 9: 1269

Copper sulfate–iron sulfate systems (liquid)

radiation chemistry of aqueous solutions of, 9: 2661(J)

Copper sulfides

entrainment of P^{32} on, 9: 862(J)

molten, self-diffusion of Cu, 9: 1467(R)

Copper–tin alloys

diffusionless phase transformation, 9: 1861(R)

heats of formation and precipitation in, calorimetric investigation of, 9: 199(J)

Copper–titanium alloys

heat treatment, mechanical properties, and microstructure, 9: 1875(J)

preparation by nonconsumable and consumable electrode arc melting, 9: 2293(R)

room-temperature dynamic elastic modulus and its ratio to density, 9: 2728(R)

Copper–uranium sandstone deposits (Utah)

occurrence in White Canyon Area, 9: 1512

Copper–zinc alloys

(See also Brass.)

relaxation effects in solid solutions of, arising from changes in local order, 9: 204(J)

relaxation strength, 9: 1537(J)

Cordierites

thermal fracture under quasi-static thermal stresses, 9: 1506(J)

Cornell Aeronautical Lab., Inc.

progress reports on compressive-stress-rupture properties of high-temperature materials, 9: 3503(R), 3504(R)

Cornell Aeronautical Lab., Inc. (cont'd)

progress reports on development of substitute alloys for high-temperature service, 9: 3502(R)

progress reports on relaxation of Ti and Ti alloys, 9: 3505(R), 3506(R)

Corrosion

(See also appropriate subheadings under corroded materials and units and under corrosive agents; see also Electrochemical corrosion; Stress corrosion.)

of aluminum, Al–stainless steel couples, Al alloys, and stainless steels in fuming nitric acid, design and performance of equipment for, 9: 2281

book, "Protective Coatings for Metals," 9: 4144(J)

cavitation, effect of slot streams, 9: 3147

cavitation, resistance of metals to, in fresh water and sea water, 9: 3148(J)

of copper by HCl, kinetics, 9: 2251

eddy-current type diameter gage for measurement of, 9: 618

equipment for testing, design and performance, 9: 1508

inhibition, theoretical basis for investigating, 9: 3460(J)

measurement and testing with electric contact resistance equipment, 9: 1948(J)

of Ni by molten NaOH, effect of mass transfer on, 9: 951(J)

nomograph for converting rates of, 9: 2254(J)

pitting, system for rating, 9: 1510(J)

prevention of, by metal spraying, 9: 3150(J)

testing, methods for cleaning of exposed specimens for, 9: 952(J)

Corrosion films

removal of, from reactor structural materials corroded by high-temperature water, 9: 154

Corrosion inhibitors

(See also Antioxidants.)

effectiveness of, for Al and steel, 9: 947(R)

effectiveness of, for C steel in acid medium, 9: 156(J)

effectiveness of Na dichromate–chloramine mixtures for corrosion of Al, Zn, steel, and Al-stainless steel and Zn-stainless steel couples by H_2O, 9: 153

effectiveness of pertechnetate ion as, 9: 1825

protective action of pigments as, on steel, 9: 2258(J)

Corrosion loops

cleaning of Na from, with NH_3, 9: 4179(R)

cleaning of Na from by flushing with liquid Na or NaK, 9: 4175(R)

contamination and performance of liquid–Na, 9: 1903

design, 9: 948

design, for liquid Na, 9: 1897(R), 1898(R)

design and operation of liquid–Na, 9: 1899(R)

in-pile, disassembly of, exposed in Low Intensity Training Reactor, 9: 752(J)

radioactive leak contamination in, measurement, 9: 4175(R)

thermal and hydrodynamic characteristics of liquid Na, 9: 1900(R)

Corrosion-resistant alloys

specific heat and enthalpy, 9: 2308(J)

survey, corrosion data charts, and directory, 9: 137(J)

Corticosterones

chromatographic determination of, in animal tissues, 9: 3365

Corticotropin

therapeutic uses of, in acute radiation syndrome, 9: 2123(J)

Cortisone

effects of, on acute radiation syndrome in mice, 9: 838(J)

effects of, on response of lethally irradiated mice to injections of rat bone marrow, 9: 4051

Cortisone (cont'd)
effects of, on survival time in x-irradiated rate, 9: 2591
Cosmic electrons
high energy, angular distribution in air showers, calculation of, 9: 2362(J)
production and energy transfer from nuclear interactions, 9: 1565
production by high-energy photons, 9: 2813(J)
production cross section of triplets by electron pairs, 9: 1300(J)
production from electron interactions, 9: 1575(J)
Cosmic mesons
angular distribution and east-west asymmetry, 9: 1917(J)
diurnal variation of intensity, cycle of world-wide changes in, 9: 257(J)
production, latitudinal effects, 9: 1921(J)
production of, by cosmic proton collisions, 9: 674(J)
residual range of delayed, in Pb, 9: 679(J)
Cosmic mesons (μ)
geomagnetic effects on formation of, 9: 258(J)
low-energy differential range spectrum of, 9: 1003(J)
momentum distribution and charge ratio at zenith angles in E-W plane, 9: 680(J)
spectra of, analysis used to calculate air spectrum of mesons, 9: 256(J)
underground penetration, 9: 1293(J)
Cosmic mesons (π)
mean free path for shower production by, 9: 1925(J)
in penetrating showers produced in Pb and C at 11,200 ft, 9: 1929(J)
spectra of, calculated from μ-meson spectra, 9: 256(J)
Cosmic neutrons
density, latitudinal variation, 9: 2363(J)
high-altitude density of, at the geomagnetic pole, 9: 3564(J)
measurement below H_2O by nuclear emulsions, 9: 3946(J)
Cosmic particles
acceleration of, in interstellar space, 9: 682(J)
angular distribution and transition effect for individual, 9: 3559(J)
angular distribution of, in the stratosphere, 9: 3905(J)
Cherenkov radiation by, in atmosphere, 9: 1920(J)
cloud chamber data, collection, reduction, and analysis of, 9: 2808
disintegration, 9: 2808
flux of primary, of atomic number $Z \geq 2$ at geomagnetic latitude 30°, 9: 2361(J)
heavy, interactions with target materials, 9: 2815(J)
properties and decay schemes, 9: 2809(J)
residual range of delayed, in Pb, 9: 679(J)
time coherence of associated, under Pb and air, 9: 1301(J)
Cosmic photons
spectrum of, in lower atmosphere, 9: 1571(J)
Cosmic protons
absorption in atmosphere, 9: 3235(J)
angular distribution, 9: 1917(J)
diffusion in interstellar medium, equations for, 9: 4222(J)
momentum spectrum, absorption range, and production at 3200 m elevation, 9: 3907(J)
as primary component of cosmic radiation, production of cosmic mesons by, 9: 674(J)
range in Pb, 9: 1922(J)
Cosmic radiation
absorption in atmosphere, 9: 3235(J)
absorption in Pb at varying altitude, 9: 678(J)
abundance of Li, Be, and B in primary, 9: 1299(J)
Cosmic radiation (cont'd)
acceleration of, by electromagnetic induction in galaxies, 9: 673(J)
alpha-particle component of, determination, 9: 1007(J)
alpha particles in, near geomagnetic equator, 9: 1292(J)
alpha particle measurement with Cherenkov counters, 9: 255
amplitude changes of 27-day intensity variation with solar activity, 9: 1002(J)
anisotropy of high-energy, 9: 675(J)
antiproton event in, photons emitted in annihilation of, 9: 261(J)
asymmetries in E-W distribution, 9: 2810(J)
attenuation in concrete and bursts in NaI (Tl) near sea level, 9: 676(J)
biological effects of, contribution of ionization dosage from heavy nuclei in living tissue, 9: 3362
biological effects of, on aviation personnel, 9: 34(J)
biological effects of tissue ionization dosage from, 9: 3726
cascade theory, generating functions, 9: 1919(J)
composition of primary component at λ 10°N, 9: 1297(J)
cosmic protons as primary component of, 9: 674(J)
distribution of stars of, in nuclear emulsions, 9: 260(J)
energetic disintegration of a heavy nuclear fragment found in high altitude, 9: 677(J)
energy loss of nuclear component by ionization, 9: 1924(J)
energy spectra of heavy primary, 9: 1296(J)
energy spectrum of low-energy γ component, 9: 3565(J)
geomagnetic effects on formation of μ mesons by, 9: 258(J)
intensity, recurrence phenomenon in 24-hour, 9: 4218(J)
intensity fluctuations at sea level, 9: 1004(J)
interaction with N, production of Be^7 by, 9: 3655(J)
interactions with nucleons underground, cross section for, 9: 1006(J)
latitude effect at low altitudes, 9: 4217(J)
latitude effects and correlation with E-W asymmetry, 9: 2811(J)
latitudinal variations, meteorological factors for hard-component, 9: 1921(J)
mass spectra of, at sea level, measurement by magnetic mass spectrograph, 9: 1918(J)
mean-life determinations of unstable charged particles from, 9: 1009(J)
measurement of multiply charged, by Cherenkov radiation, 9: 254
K-mesonic decay of a slow secondary particle in, 9: 3236(J)
mesonic decay of excited triton ejected from type 21 + 5p star, 9: 4220(J)
momentum distribution and charge ratio of penetrating component, 9: 680(J)
momentum spectra and positive excess at 3,650 m, 9: 3562(J)
nature of, outline, 9: 3906(J)
nuclear cascade theory, 9: 2366(J)
nuclear disintegrations produced in Pb at 3500 m by, 9: 259(J)
origin, 9: 1923(J)
origin and acceleration, 9: 3233(J)
origin of, as derived from cosmic shower production, 9: 681(J)
production spectra of μ and π mesons in atmosphere, 9: 1298(J)
progress in physics of, review of, 9: 2364(J)
relation between intensities of, and heights of isobar levels, positive temperature effect in, 9: 1566(J)
relation of tritium production by 2.2-Bev protons on Fe to, 9: 3651(J)
review, 9: 2809(J)
scattering and intensity of secondaries in the atmosphere, 9: 3234(J)
soft component, direct detection above 50 km in auroral zone, 9: 1928(J)
spectra of proton and ionic component of, break in, 9: 455(J)
statistical estimate of exponent of energy law for primary, 9: 1568(J)

Cosmic radiation (cont'd)

theory of origin, 9: 2812(J)

time variation of intensity at sea level, 9: 1570(J)

underground penetration, 9: 1293(J)

unstable heavy meson decaying in flight in photographic emulsion exposed at high altitudes, 9: 1294(J)

zenithal angle dependence of hard and soft components, 9: 259(J)

Cosmic-ray spectrometers

design, 9: 1570

operation of hodoscope, 9: 1295(J)

Cosmic showers

analysis of 3×10^{13} ev, 9: 1927(J)

angular distribution of high energy electrons in, calculation of, 9: 2362(J)

design of selecting circuit for, 9: 3560(J)

electron production in high-energy nuclear interactions, 9: 1565

energy and angular distribution of mesons in cosmic jets, 9: 1008(J)

energy spectrum by multiplate cloud chambers, 9: 1567(J)

extensive, geometry of nuclear active component, 9: 2367(J)

lateral distribution of various components of, at sea level, 9: 4223(J)

mass spectrum of particles in nuclear emulsions from cosmic ray interactions, 9: 4219(J)

residual range of delayed particles in Pb, 9: 679(J)

time variations of, production of, 9: 681(J)

Cosmology

radioactivity as an aid in study of, 9: 2265(J)

Cosmotron

(See Brookhaven Synchrotron.)

Cotton

continuous ion exchange with an endless belt of phosphorylated, 9: 3104(J)

Countercurrent separation processes

design and operation of a cell for preparative, 9: 120(J)

Couples

(Specific couples are indexed with components arranged in both alphabetical and inverted orders.)

diffusion in, effects on cross section area, 9: 3526(J)

galling and seizing of, by friction coefficients, 9: 1269

Cove District (Ariz.)

geology, 9: 2262(R)

Crane Co.

progress reports on relaxation behavior of Ti alloys, 9: 1858(R), 3176(R)

Creep

(See also appropriate subheadings under specific materials.)

of cadmium crystals, effects of α irradiation on, 9: 433(J)

effects of structure on, at high temperatures, 9: 2732

measurement of, in heat-resisting alloys, 9: 3504(R)

method for measuring, for reactor use, 9: 1120(J)

Cross Mountain Quadrangle (Calif.)

geology, 9: 3154

Cross sections

(See also specific cross sections, e.g., Neutron scattering cross sections; see also appropriate subheadings under specific elements and isotopes.)

theorem for systems of several identical particles, 9: 461(J)

Crucibles

(See also crucibles identified with material, e.g., Aluminum oxide crucibles; see also appropriate subheadings under materials for which crucibles are used.)

design, for low-density foamed Al–Mg alloys, 9: 3182

Cryogenics

bibliography of recently published articles, 9: 1552

magnetic refrigerator for maintaining temperatures below 1°K, design and operation, 9: 1022(J)

Cryostats

booster, for temperatures down to 0.74°K, 9: 2392(J)

Crystal detectors

(Radiation detectors operating on changes in electric conductivity; for complete instruments, see Radiation detection instruments (colorimetric); see also Chemical radiation detectors; Scintillation detectors.)

properties of Ge, for fast neutron flux measurements, 9: 1042

radiation probe using CdS crystal of high resolution and small size, for use with ionization chamber, design, 9: 1333(J)

Crystal Mountain District (Colo.)

occurrence of pegmatite deposits and geology, 9: 3157(J)

Crystal structure

continuously recording electron diffraction camera for studies of transitions in, 9: 1572(J)

direct determination of, by high-speed digital computers, 9: 2817(J)

effect on metallic properties, 9: 3908(J)

of metals and alloys, number of vacancies and energy of vacancy formation in, 9: 3525(J)

Crystals

(See also specific crystals, e.g., Copper crystals; Sodium iodide crystals.)

electronic levels of atoms adsorbed on surface of, 9: 1930(J)

neutron total scattering cross sections, interference effects, 9: 2048(J)

production of high-crystallization temperature, in Verneuil furnace, 9: 1932(J)

quadrupole nuclear spin-lattice relation in, theory of, 9: 1012(J)

scatter of high-energy electrons in, 9: 2495(J)

single, of Si, Cu, In antimonide, and quartz, x-ray diffraction pattern, effects of radiation, 9: 2831

Curium

chelation with thenoyltrifluoroacetone, 9: 924(J)

Curium isotopes Cm^{238}

production and separation, 9: 1443(P)

Curium oxides

preparation and crystal structure, search for quadrivalent Cm, 9: 3802(J)

Current integrators

(See also Electrometers; Radiation detection instruments (ion current type).)

design for integrating ion beam from cyclotron, 9: 3574

design of, for Cockcroft-Walton accelerator, 9: 1654(J)

Current regulators

(See also Voltage regulators.)

for cyclotron magnet, modification, 9: 3575

for cyclotron magnets, design, 9: 3576

design and performance of electron-tube, 9: 3546

design of 100-amp d-c servostabilizer, 9: 1584(J)

for mass spectrometer ion sources, 9: 1031(J)

Cyanogen

combustion of, at high pressures, 9: 57(R)

Cyclic hydrocarbons

(See Aromatic compounds.)

Cyclobutene, hexafluoro-

vibrational spectra, 9: 2651(J)

Cyclohexane, 1,2-dichlorodecafluoro-

synthesis and reactions of, 9: 2189(J)

Cyclohexanol–water systems
mass transfer in a horizontal liquid-liquid extraction tube, properties affecting the film coefficients of, 9: 2208
Cyclopentadienyl compounds
with scandium, Y, La, and Ce, and some rare earths, 9: 3096(J)
Cyclotrons
(See also Synchrocyclotrons.)
beam position of Columbia 38-in., 9: 3965(R)
beams, radiation-chemical studies with, 9: 2200(J)
Crocker 60-inch, index of available information, 9: 773
design of UCRL 60-in., 9: 3966(R)
external beams, control device for, 9: 2924
focusing and analyzing system for 27-in. Rochester cyclotron, 9: 394
high-intensity ion source for, 9: 1587(J)
ion source for, design and performance, 9: 3662
mobile shielding for target removal from, 9: 810(J)
modifications in 184 in. and 60 in., 9: 2890(R)
orbital periods of electrons in microtrons, 9: 396(J)
radiofrequency amplifier design using thyratron control, 9: 2925(J)
radiofrequency system of UCRL 184-in., 9: 3966(R)
techniques for use of, in radiation damage studies, 9: 430(J)
variable energy, preliminary report on, of the Univ. of Rochester, 9: 1653
Cylinders
boundary value problems of thin walled circular, 9: 933(J)
break-away cavitation behind, mathematical analysis, 9: 3127(J)
containing radioactive sources, surface dosage rates, 9: 3212
hollow, thermal stresses in, 9: 609
imperfectly absorbing, neutron density in non-scattering, 9: 3997(J)
mathematical analysis of, as radiation sources, 9: 779
neutron capture and scattering analysis, 9: 346
self-shielding factors for long hollow, 9: 2517(J)
shell-like structures, bibliography of books and articles, 9: 3439
stresses caused by exponential temperature distribution, analysis, 9: 4117
thermal rupture of, effects of shape on, 9: 1503(J)
thick-walled steel, overstrained by internal pressure, behavior, 9: 3453
Cyrano Reactor
(See Saclay Reactor.)
Cysteinamine
(See Ethanethiol, 2-amino-.)
Cysteine
effect of dietary, on gene action in Drosophila, 9: 3371(J)
protective effects of, against radiation effects on catalase, 9: 2199(J)
protective effects of, against radiation injuries, 9: 2061(J), 3015, 3035
Cystine
protective effects of, against radiation effects on catalase, 9: 2199(J)
Cytoplasm
effects of radiation on, in Habrobracon eggs, 9: 2573(J)

D

Daisy Fluorspar Mine (Nev.)
exploration, 9: 1260(J)
Dakota Mine (S. Dak.)
uranium distribution in, 9: 165(J)
Dakota sandstone (Ariz.)
geology, 9: 1828
Daphnia
culturing P^{32}-labeled, 9: 3358(J)
Darby Mountains District (Alaska)
uranium distribution in, 9: 1523(J)
Dark Horse Claim (S. Dak.)
uranium distribution, 9: 165(J)
Datil Area (N. Mex.)
geology and geophysical exploration, 9: 2709
geology exploration, stratigraphy, and U-distribution, 9: 955(J)
David Sarnoff Research Center
progress reports on electronic devices for nuclear physics, 9: 1580(R), 1893(R), 3251(R)
progress reports on use of radioactive materials, 9: 3208(R)
Davis Mesa Quadrangle (Colo.)
preliminary geologic map of, 9: 4154(J)
Deadwood Formation (S. Dak.)
geology of, 9: 165(J)
Decontaminating solutions
effectiveness of, for cotton clothing, 9: 1704
Decontamination
of cotton clothing, evaluation of laundering agents and techniques for, 9: 1704
of porcelain enamel, 9: 617(J)
Decorah Mine (S. Dak.)
uranium and Th distribution, 9: 165(J)
Deer Creek District (Mont.)
exploration for U and Th deposits in, 9: 1520(J)
Deer Flat Area (Utah)
mineralogy, 9: 1829
Defiance Uplift (Ariz.)
exploration stratigraphy and geology, 9: 1828
Degasification
of liquids, equipment, 9: 2195
Delayed neutrons
effects on reactor kinetics, 9: 3642(J)
Delta rays
(See Electrons.)
Densitometers
for measuring densities of liquid metals at temperatures up to 1000°C, 9: 3386
Department of Mines and Technical Surveys. Mines Branch (Canada)
administrative progress reports, 9: 2260(R)
Desert Lakes Quandrangle (Utah)
photogeologic map of, 9: 2270(J)
Detonation waves
(See also Explosions.)
equation of state, 9: 3214
relation between velocity and radius of curvature of, 9: 995(J)
velocity, measurement by microwave resonator techniques, 9: 4264
Deuterioörganic compounds
chemical reactions, review, 9: 3062(J)
Deuterium
absorption reaction ($\alpha^4 + d \rightarrow p + p$) at 76 and 94 Mev, cross sections, 9: 424(J)
cross sections and angular distributions for (d,t) and (d, He^3) reactions, 9: 792(J)
determination of, by isotopic gas analysis, 9: 2180(J)
distribution in isotopic exchange reactions of H, 9: 2649(J)

Deuterium (cont'd)
exchange of acetic acid and, effects of nitro compounds, 9: 2182(J)
exchange of, between HF and hydrocarbons, 9: 3784
diffusion in Zr, 9: 244(J)
diffusion through Ni and design of leak for, 9: 1577(J)
electrolytic separation of, from H, effect of nitrate ion and NH_3 on, 9: 1594
gamma reactions (γ,π), 9: 3966(R)
helium ion (He^3,p) reactions in energy range 100 to 800 kev, 9: 2451(J)
infrared emission spectra of molecular, between 1.15 and 1.97μ, 9: 2520(J)
isotope effects of, in reaction of Zn with water vapor, 9: 73(J)
mass ratio of T and, 9: 2097(J)
mass-spectrographic determination of, in hydrogen, 9: 3920
π-meson total cross sections, 9: 1111(J)
π^--meson scattering at 119-Mev, angular distribution, 9: 2488(J)
microdetermination in water, vapor-tension method, 9: 2645(J), 3780(J)
neutron total cross section measurements at high energies, 9: 4004(J)
nuclear magnetic moment of, calculated by proton-neutron coupling, 9: 742(J)
photodisintegration cross section, 9: 3657(J)
proton cross sections, 9: 2459
proton total cross sections, 9: 2458
proton total cross sections at 208 and 315 Mev, 9: 358(J)
quenching of resonance radiation of K by, 9: 238(J)
reduction of silver chloride by, 9: 3765
reduction of silver chlorides by, reaction mechanisms, 9: 3764
scattering of 192-Mev electrons by, 9: 4305(J)
solidified, compressibilities at low temperature, 9: 2824(J)
thermal conductometric determination in partially deuterated boron hydrides, 9: 1203(J)
thermonuclear reactions of protons with, in stars, 9: 3647(J)
triton reactions (t,α) at 1.5 Mev, 9: 4291(J)

Deuterium (liquid)
thermal conductivity of, from 19 to 26°K., 9: 889(J)

Deuterium hydrides
isotopic reactions with H_2O, 9: 861(J)

Deuterium–hydrogen systems
radiation-induced and catalytic-induced equilibrium constants, 9: 4090(J)

Deuterium oxides
(See Water-d; Water-d_2.)

Deuterons
angular distributions of inelastically scattered, 9: 2331(R)
attenuation of 190-Mev, by C, U, and Be, 9: 778
binding energy of, contribution of nonstatic forces to, 9: 4031(J)
bombardment of C targets by high-energy, production of neutrons in, 9: 1993(J)
cross section for elastic scattering of 20.6-Mev protons, 9: 2470(J)
cross sections and angular distributions of tritons and He^3 from deuterium bombardment, 9: 792(J)
definition of virtual level of, 9: 3280(J)
detection and measurement of, from photonuclear reactions, 9: 1037
disintegration by electron bombardment, theory, 9: 2533(J)
elastic scattering by He, 9: 410(J)
exchange scattering of 380-Mev neutrons on, 9: 3670(J)
formation of, from interaction of polarized protons, 9: 790(J)
high-energy d-d collisions, H^3 and He^3 production in, comparison, 9: 1659(J)
inactivation of poliomyelitis virus, 9: 3737(J)

Deuterons (cont'd)
interaction of, with carbon, 9: 795(J)
interaction with neutrons, recoil deuterons and disintegration protons from, 9: 2939(J)
negative pions from neutron bombardment of, 9: 2914
neutron and proton scattering, 9: 2037(R)
nuclear magnetic and electric quadrupole moments, calculation with pseudoscalar meson theory, 9: 367(J)
nuclear reactions (d,p), numerical calculation of angular distributions, 9: 2095(J)
nuclear reactions (d,p), proton polarization in, 9: 1647(J)
nuclear reactions (d,p), Q values of, neutron binding energies from, 9: 737(J)
nuclear reactions (d,p) and (d,n), Coulomb corrections and numerical results, 9: 3658(J)
photodisintegration, 9: 4006(J), 4327(J)
photodisintegration at 2.615 Mev, 9: 1342(J)
photodisintegration of, by high-energy γ rays, 9: 2018(J)
photodisintegration of, sum rules for, 9: 3297(J)
pickup, from 95-mev protons on C, angular distribution, 9: 4307(J)
polarizability, variation calculation of, 9: 4337(J)
production of, in n-p collisions, 9: 784(J)
quadrupole moment of, mesonic corrections to, 9: 814(J)
range-energy and energy-momentum relations, tables, 9: 402
scattering by Mg and Be at 4.0 to 7.8 Mev, differential cross sections for, 9: 2944(J)
spin polarization, 9: 4283(J)
stripping of, measurement of nuclear radius from, 9: 1997(J)

Dewey Bridge Area (Utah)
geology and exploration, 9: 1256

Diamonds
(See also Carbons; Crystal detectors.)
effects of radiation on x-ray scattering by, 9: 800(R)
x-ray scattering by, 9: 971(R)

Dielectric breakdown
(See also specific materials, instruments, etc.; see also Electric insulators.)
high-voltage, in vacuum, 9: 1935
high-voltage insulators and sparking problems, 9: 656

Dielectric constants
measurement, 9: 547

Dielectrics
(See also Electric insulators.)
aging characteristics and nondestructive testing, 9: 1553(R)
effects of radiation and repetitive voltage surges on, 9: 1554(R)
effects of radiation on, 9: 1553(R)
effects of varnish treatment on thermal aging characteristics of, 9: 1554(R)
fabrication of TiO_2, for linear accelerator wave guides, 9: 1096
thermal stability and nondestructive testing of, 9: 1554(R)
in 3 cm wavelength region, measurements of electrical and mechanical properties, 9: 3962

Dies
(See also Molds.)
design of conical, for Ti alloy extrusion, 9: 2276(R)

Diet
effects of, on liver blood flow, tracer study, 9: 2609
effects of, on respiratory quotient in burros, 9: 2572(J)
vitamin C-free, effects on radiosensitivity of tumors in laboratory animals and man, 9: 3043(J)

Diethanolamine
(See Ethanol, 2,2-iminodi-.)
Differential equations
treating of linear ordinary differential systems of n^{th} order with, 9: 4240
Diffraction gratings
resolving power, 9: 2522(J)
Diffusion
(See also Bonding; Grain-boundary diffusion; Self-diffusion; Thermal diffusion.)
analysis of neutron, by electric circuit analog, 9: 3287
effects on changes in cross section area of metallic cylinders welded to each other, 9: 3526(J)
measurement of, use of electrolytic polishing for removal of layers of metals and alloys in, 9: 3874
of metals and alloys, review, 9: 3206(J)
shear-cell and capillary methods for study of, in molten Pb–Bi systems, 9: 179
surface, of metals, interferometric method for measurement of, 9: 3455
surface, of metals, measurement, 9: 3845(R)
surface counting in, β absorption in thin layers of Ni, Al, and Co and relation to, 9: 4000(J)
theory of steady-state, 9: 969
in ternary metallic systems, measurements and theory, 9: 4214(J)
Diketones
(See also Ketones.)
absorption spectra of uranyl complexes with, 9: 135(J)
preparation, spectra, and ionization constants of diaroylmethanes, 9: 2133
Dilatometry
alpha-sigma transformations and dilatation-temperature curves, 9: 3537(J)
Dimethylamine
direct fluorination, 9: 890
Dioxane
solution with water, determination of pKd values and stability constants of, 9: 869(J)
Disks
thermal shock resistance of brittle, theory, 9: 142
Dissociation
energy of gaseous compounds, table, 9: 2437
Dissolution
absolute rates of, effects of flow conditions on, 9: 3448(J)
Distillation
(See also Evaporation.)
fractional, theory, 9: 3797
of materials in precision distillation columns, mathematical analysis, 9: 3429(J)
Distillation apparatus
(See also Column packing; Evaporators; Packed columns.)
design and performance of, for separation of hexone from aqueous solution of U, 9: 533
precision, separation of materials in, mathematical analysis, 9: 3429(J)
Distillation Products Industries, Rochester
progress reports on colorimetric and conductimetric dosimeters, 9: 4241(R), 4242(R)
Dithizone, polonium derivatives
chemical composition, determination, 9: 4069(J)
Dodecylamine acetate
adsorption on hematite and quartz, surface tension, and wetting of hematite and quartz by, 9: 1486
Dogs
lethal dosage determination of radiation for, 9: 1720
lethal effects of radiation, 9: 2567(J)
Dolomites
thermal conductivity and thermal diffusion, 9: 1283
Doty Claim (Calif.)
radioactive minerals in, 9: 3837(J)
Dow Corning Corp.
progress reports on fluorine-containing polyethers, 9: 1767(R)
Dripping Springs Area (Utah)
mineralogy, 9: 1829
Drops
evaporation of spherical liquid, in a current of gas, 9: 1015(J)
movement on a solid, kinetic and thermodynamic study, 9: 3210
separation of ions or groups of ions in, 9: 1786
Drosophila
bristles, effects of radiation on, 9: 2585(J)
effects of high and low intensity x radiation on, comparison, 9: 3029(J)
natural populations of, genetic factors, 9: 5(R)
radioinduced mutations in, 9: 30(J), 3731(J)
radioinduced mutations in, comparison of effects of fast neutrons and x radiation, 9: 824(J)
Drugs
(See also Analgesics, Anesthetics.)
biological effects of, compared with effects of radiation, 9: 3008
effect of chlorpromazine on cardiac arrhythmias induced by intracerebral injection of tryptamine-strophanthidin in dogs, 9: 3005
radiomimetic, effects on body weight and blood picture of rats compared with effects of whole-body x irradiation, 9: 3013(J)
sterilization by high-energy electrons, 9: 2053(J)
Dry boxes
argon atmospheres, apparatus for testing, 9: 3776
plastic sealer for use with, 9: 565(J)
Ductility
(See also appropriate subheadings under specific materials.)
of high-temperature alloys, device for testing and results, 9: 4197(J)
of metals, new criterion for, 9: 1867(J)
Duke Univ.
progress reports of Microwave Lab., 9: 1134(R)
progress reports on radiofrequency spectroscopy, 9: 4332(R)
Dusts
(See also Aerosols; Particles; Powders.)
in air, spectrographic determination of Be in, 9: 122(J)
design and performance of scrubbers for wet, from gas streams, 9: 3091(J)
monitoring of toxic, 9: 1913(J)
properties, measurement, and control of industrial, book, 9: 3808(J)
radioactive, sampling of, design of collector for, 9: 1798(R), 1799(R), 1800(R), 1801(R)
sampler for radioactive, 9: 1802(R)
sampling equipment, evaluation, 9: 935
sampling of, for dust-content measurements, influence of dust dynamics, 9: 2358(J)
suspended, charging of, theory, 9: 3557(J)
of uranium oxides, effects of particle size on toxicity following inhalation by animals, 9: 1731(J)
Dyes
interaction with hair fibers, tracer study, 9: 922(J)
pulmonary absorption of, in rats and dogs, 9: 3360

Dysprosium

heat of sublimation, 9: 1994(R)

tissue distribution of, in rats, tracer study, 9: 2551(R)

Dysprosium chlorides

crystal structure, 9: 544(J)

Dysprosium isotopes Dy^{164}

energy levels, 9: 1405(J)

Dysprosium nitrates

solvent partition of, between nitric acid and tributyl phosphate, 9: 901

E

Early Day Claim

assay of samples from, 9: 1257

Earth

(Restricted to studies of the planet or portions of its crust as such; see also Soils.)

absorption of cosmic radiation underground, 9: 1293(J)

abundance of chemical elements in crust of, 9: 1830(J)

age calculations by isotopic composition of Pb in earth and meteorites, 9: 1835(J)

radioactive decay in, effect on temperature gradients, 9: 2796(J)

thermal conductivity of, effect on temperature gradients, 9: 2796(J)

East Walker River Area (Nev.)

exploration, geology, and U distribution, 9: 1516(J)

uranium distribution, 9: 1260(J)

Edisto Island Area (S. C.)

geophysical exploration, map of, 9: 1833(J)

Eggs

(See also Embryos.)

of Ascaris, effects of irradiation survival and cleavage, effects of temperature, 9: 2571(J)

developing, radiosensitivity of, 9: 3(R)

effects of oxygen on frequency of x-ray induced mutations in, of Habrobracon, 9: 2592(J)

effects of x irradiation of, on development of embryos of frogs, 9: 820

effects of x radiation and nitrogen mustard on development of, of Habrobracon, 9: 3024(J)

gamma radiation effects on ovulation and fertilization in frog, 9: 2581(J)

of Habrobracon, effects of radiation on cytoplasm, 9: 2573(J)

metabolism in, effects of radiation on, in grasshoppers, 9: 495(J)

yolks of, effects of radiation, 9: 2547(R)

Egnar Quadrangle (Colo.)

mineral investigations field studies map of, 9: 4152(J)

Elasticity

design of an electrostatic apparatus for dynamic elastic moduli determinations of Ti alloys, 9: 2293(R)

Elastomers

(See also Rubber.)

effects of radiation on, 9: 1550(R)

fluorinated polymers, preparation and properties, 9: 1487(R)

mechanical properties of, literature survey, 9: 3452

synthesis and properties of fluorinated polydienes and polyacrylates, 9: 3083(R)

Eldorado Claim

assay of samples from, 9: 1257

Electric arc furnaces

for casting Ti and Ti alloys, design, 9: 3847

Electric conductivity

of CrN and Cr–N–Ti alloys, 9: 2345(J)

Electric conductivity (cont'd)

design and performance of instrument for the recording of isothermal electrical resistance recovery, 9: 3914

measurement of high resistances, equipment and methods for, 9: 3389(R)

of metals at high temperatures, theory and design and performance of equipment for measurement, 9: 1502

method of measuring hi-meg resistors, 9: 2827

methods of measurement, 9: 974

theory of, of fused salts, 9: 2139(J)

Electric control systems

frequency-response method applied to automatic-feedback, bibliography, 9: 287(J)

for vacuum pumps, design, 9: 3243(J)

Electric discharge

basic data, 9: 1304

breakdown processes in N_2, O_2, and mixtures, 9: 2377(J)

departure from Pachen's Law of, in gases, 9: 2376(J)

in gases, theory of spherical probes, 9: 4225(J)

high-frequency, in low-pressure gases, 9: 3567(J)

Electric generators

radioactive, design, 9: 1440(P)

Electric insulators

(See also Dielectrics.)

aging characteristics and nondestructive testing, 9: 1553(R)

corrosion in NaK at 250 to 300°F, 9: 4179(R)

effects of high neutron flux on, 9: 429

effects of radiation, 9: 3208(R)

effects of radiation and repetitive voltage surges on, 9: 1554(R)

effects of radiation on, 9: 1553(R)

design of high-voltage bushing, 9: 1433(P)

effects of varnish treatment on thermal aging characteristics of, 9: 1554(R)

electric losses in metal-ceramic seals, 9: 2786

performance for high voltages, 9: 656

performance of compressed gases and vacuums as, 9: 1368

thermal stability and nondestructive testing of, 9: 1554(R)

Electric potential

polarization parameters, inclusion of, in mathematical analysis of galvanic corrosion, 9: 1824

precision high-voltage attenuator with good frequency response, 9: 4207

recording devices for, design, 9: 2386

Electric power

from separated fission products, survey of methods for, 9: 3716(J)

Electric probes

in gas discharges, theory, 9: 4225(J)

Electric resistance

(See Electric conductivity.)

Electric resistors

(See Resistors.)

Electric switchgear

design, 9: 1439(P)

Electrical Engineering Research Lab., Engineering Experiment Station, Univ. of Ill.

progress reports on conducting thin films, 9: 3175(R)

progress reports on research and investigation leading to methods of generating and detecting radiation in the 100 to 1000μ range of the spectrum, 9: 2885(R), 2886(R)

Electrochemical analysis

of HCl solutions containing Po, apparatus for, 9: 3757

Electrochemical corrosion

average current density calculation, 9: 3823

effect of polarization and liquid thickness on total corrosion current in, mathematical analysis, 9: 155

effects of insulator between coplaner electrodes on, mathematical analysis, 9: 1823

geometric factors in electrical measurements relating to, and its prevention, 9: 3152(J)

mathematical analysis of, 9: 619, 620

polarization parameters, incorporation into potential functions in, mathematical analysis, 9: 1824

potentiostat for study of, design, 9: 157(J)

using semi-infinite coplanar electrodes with equal constant polarization parameters, mathematical analysis, 9: 152

Electrochemistry

electrolytic current flow by bubble migration, 9: 230

of metals in molten salts, 9: 522(J)

Electrochromatography

electrical mobility of phosphate ions in paper, 9: 1222(J)

electroösmosis in paper, with electrode vessels, 9: 1220(J)

electroösmosis of lactic acid solutions in paper electrochromatography with electrodes on paper, 9: 1221(J)

paper, effect of concentration and sorption on migration of cations in, 9: 4106(J)

Electrodeposition

(See also appropriate subheadings under materials deposited.)

of suspended dust particles on wire, mathematical analysis, 9: 3557(J)

Electrodes

(See also electrodes as identified by material, e.g., Mercury electrodes; see also Cathodes.)

activity measurements of Ca, Mg, Na, and K ions in electrolytic solutions with resin membrane, 9: 2149(J)

anion activity measurements of chloride, sulfate, and La ions with resin membrane, 9: 2150(J)

for condenser impulse welding, design and performance of, 9: 641

high-temperature, performance of Ag, AgCl and Hg, HgCl combinations as, 9: 2623(J)

for nuclear batteries, design, 9: 3548(R), 3549(R), 3550(R)

operating characteristics of different waterproofing coatings on, in underwater metallic arc welding, 9: 2316(J)

Electrolysis

electrolytic current flow by bubble migration, 9: 230

preparation of metals, alloys, and metallic compounds from fused salts by, 9: 2744(J)

Electrolytes

concentration of Na and K in serum, effects of total-body irradiation on, in hamsters, 9: 489(J)

for polarographic determination of U, 9: 1149(J)

for polarographic determination of U in presence of other ions, 9: 1150(J)

Electrolytic cells

electrochemical behavior of Tl/fused salt/Pt, 9: 3067(J)

electromotive force of D_2, DCl, AgCl, Ag and D_2 NaOD + NaCl, AgCl, Ag, 9: 3078(J)

electromotive force of, involving pellets of a solid solution of CaO in ZrO_2 as electrolyte, 9: 3177(R)

miniature, for the preparation of small quantities of alkali metals, design, 9: 921(J)

preparation and performance of, containing $Mg/LiNO_3 \cdot KCl \cdot K_2CrO_4/Ag$, 9: 853

Electrolytic polishing

equipment for, 9: 2328(J)

use of, for removing layers of metals and alloys, determination of diffusion coefficients by, 9: 3874

Electromagnetic fields

analytic determination in air gap of CERN synchrotron, 9: 388

geophysical prospecting with, theory of, 9: 1258(J)

Electromagnetic fields (cont'd)

interaction with charged particles, theory, 9: 4025

measurement by nuclear resonance, 9: 1327(J)

measurement for CERN synchrotron, 9: 1367

radiative effects in constant, avoiding of infrared divergencies in, 9: 464(J)

Electromagnetic flowmeters

(See Flowmeters.)

Electromagnetic pumps

for circulating Mg—Th alloy at 1000°C, design, 9: 931

design and performance of 400-gpm, 3-phase flat linear, for low line pressures, 9: 3815

efficiency of, in reactor cooling systems, 9: 4175(R)

performance with liquid Na or NaK alloys, 9: 4179(R)

Electromagnetic separation

(See also Calutrons; Mass spectrography; Mass spectrometers.)

apparatus and collection of gaseous isotopes, 9: 3247

Electromagnetic Separation Plant

electrical system, 9: 656

manual of vacuum systems and techniques, 9: 145

Electromagnetic waves

focusing of charged particle beams by TM_{01} waves, 9: 726

scattering of, from randomly uneven surface, 9: 1284(J)

Electromagnets

(See Magnets.)

Electrometallurgy

(See also Electrochemistry.)

electroforming of funnels, tubes, and trumpets of various metals, performance of liquid baths in, 9: 3495

Electrometers

(See also Electron tubes; Radiation detection instruments (ion current type).)

calibration, 9: 3924

differential, to measure modulated output current of ion chamber, 9: 1942

Electron beams

application of intense, for excitation of gases, design and performance of apparatus for, 9: 2477(J)

from betatrons, therapeutic applications, 9: 1724(J)

Cherenkov radiation from, 9: 3568(J)

dynamic pressure stage elements for projection of intense monokinetic, into gases at high pressure, design and performance of equipment, 9: 2475(J)

effects of exposure to, on latent period in bacteriophage, 9: 2570(J)

electrostatic focusing with periodic fields, 9: 264(J)

focusing in alternating-gradient channel using permanent bar magnets, 9: 395

measurement of gas density with, 9: 1940(J)

optical systems with rectilinear axes without rotational symmetry, 9: 2378(J)

relativistic, aberration, 9: 2380(J)

relativistic, electrostatic deflection, 9: 2379(J)

Electron cameras

specimen chamber design for, 9: 690(J)

Electron capture

angular correlations in, 9: 3330

probability of, influence of finite nuclear extension on, 9: 2088(J)

theoretical results, 9: 2991

Electron-diffraction analysis

continuously recording electron diffraction camera for studies of crystal structure transitions, 9: 1572(J)

Electron microscopes

application of, to mineralogic studies, design and performance, 9: 3830(J)

Electron microscopes (cont'd)

calibration, 9: 1133

conversion of transmission, into emission, 9: 275(J)

design and performance, for use in constitutional metallurgy, 9: 2327(J)

for field-emission microscopy of metals, design, 9: 2741

reflection, design, construction, and performance, 9: 3579(J)

reflection-transmission stage for, design and construction, 9: 3580(J)

specimen grid for, design, 9: 3(R)

theory of image formation, 9: 4232(J)

Electron microscopy

high-resolution evaporated-carbon replica technique for, 9: 2395(J)

inspection of selected areas of surfaces by, using replicas, 9: 247(J)

preparation of elastic tissue elements, 9: 1707(J)

reflection, examination of oxide films by, 9: 3536(J)

use in constitutional metallurgy, 9: 2327(J)

Electron multiplier tubes

(See also Photomultiplier tubes.)

application of photoelectric cells to, 9: 1617(J)

quantitative detection of positive ions by Allen-type, 9: 1051(J)

Electron pairs

emission of, in magnetic fields, 9: 414(J)

high-energy, produced in nuclear emulsion by 113-Mev positive pion, 9: 1664(J)

measurement of energy loss of, in γ-ray scintillation counter, 9: 1053(J)

production of cosmic, by high-energy photons, 9: 2813(J)

production of electron tridents between 0.1 and 10 bev, 9: 1631(J)

trident process for, mean free path for, 9: 1927(J)

Electron showers

estimate of total energy of, by scintillating sheets in γ-ray counter, 9: 1053(J)

number and energy distribution of, produced by electrons, 9: 3561(J)

Electron sources

(See also Beta sources.)

design of, 9: 1610(J)

Electron spectrometers

theory, construction, and performance, 9: 3696

Electron tubes

design and performance of current-regulating, 9: 3546

design and performance of five-stage r-f, for mass spectrometer, 9: 1579(R)

design and performance of one-stage r-f, for mass spectrometer, 9: 1578(R)

life of, in radiation detection instruments, 9: 1329(J)

longitudinal beam amplifiers, minimum noise figure derivation, 9: 4210(R)

magnetron design and development, 9: 731(R)

theory of microwave beam amplifiers, 9: 652(R)

Electronic equipment

in automatic direct reading spectrometers, 9: 3948(J)

component failures at Harwell, detailed study, 9: 3912

field failure reports and quality control, 9: 1

multiplier for HRE simulator, circuit for, 9: 371

resistance welding controls, 9: 2833(J)

Electronics

bibliography of physical, 9: 2353(J)

millimicrosecond pulse techniques, 9: 2349(J)

Electrons

absorption of, in Cu and Cd, 9: 415(J)

absorption of monoergic, in Al, 9: 791(J)

absorption processes, accelerator and high-resolution analyzer for, 9: 3665(J)

Electrons (cont'd)

acceleration of, in high-energy linear accelerators, cost factors and design, 9: 772

angular correlation with neutrinos in β decay of Ne^{19}, 9: 2059(J)

backscattering from Mg, C, Be, and Li, 9: 2041(J)

backscattering of, in spectrometers and counters, 9: 684(J)

bremsstrahlung spectrum of 1.0- to 1.40-Mev, for thick targets, 9: 1307(J)

capture and loss of, by moving ions in dense media, 9: 1563(J)

capture of, from H atoms by fast protons and from H atoms by He ions, 9: 1287(J)

classical theory of, and introduction of fundamental length, 9: 1013(J)

Compton scattering of a circularly polarized quantum by, with given spin direction, 9: 2035(J)

Coulomb scattering of high-energy, by nuclei, 9: 3671(J)

diffraction, theory of interferometer using, 9: 1024(J)

diffraction and inelastic scattering of 10^2 to 2×10^3 ev, 9: 263(J)

diffusion effects in radioactive sources, 9: 2040(J)

diffusion in argon, 9: 2539(R)

disintegration of the deuteron by, theory, 9: 2533(J)

double scattering of, with magnetic interaction, theory, 9: 1938(J)

effects of exposure to, on barley seed, 9: 3369(J)

elastic scattering from protons, angular distributions, 9: 4309(J)

elastic scattering by H atoms, perturbation calculation, 9: 1657(J)

elastic scattering of, by excited 2s and 2p states of atomic H, 9: 1381(J)

elastic scattering of high-energy, by Hg, 9: 3321(J)

elastic scattering of 125-Mev, by Be, 9: 1383(J)

electromagnetic interactions with μ mesons, 9: 2882(J)

emission and multiplication, 9: 3208(R)

emission from Mg, Al, Fe, Ni, Au, and Pb, by H_1^+ and H_2^+ ion bombardments, 9: 250(J)

emission of secondary, by 1.3-Mev electron bombardment, 9: 1306(J)

energy loss of secondary, in a cavity, effects of various wall materials on, 9: 2045(J)

energy loss of 22-kev, in metals, metal oxides, NaCl, $Ca(OH)_2$, and collodion, 9: 1665(J)

fast, effects of, on growth of tissue cultures, compared with effects of x radiation, 9: 3016(J)

fast, effects of irradiation of alkali halides by, 9: 3329(J)

focusing by TM_{01} waves, 9: 726

inelastic scattering by He, 9: 3994

inelastic scattering of, nuclear multipole transitions in, 9: 785(J)

interactions with matter, 9: 1575(J)

interferometer utilizing crystalline diffraction of, 9: 1023(J)

K, in heavy atoms, coherent scattering of γ rays by, method for evaluating, 9: 2479(J)

mass correction, theory, 9: 1067(R)

nonlinear quantum theory of, 9: 1936(J)

orbital periods of, in microtons, 9: 396(J)

photo-, longitudinal angular intensity distributions of, from various γ irradiators, 9: 4310(J)

photoluminescence of, theory, 9: 414(J)

polarization energy of 3d and 4p, 9: 2818(J)

production of electron showers by, 9: 3561(J)

production of neutrons by, in uranium, 9: 3964

properties of cylindrical space charge in electron optics, 9: 3569(J)

quantum theory of radiating, 9: 1422(J)

ranges in polyethylene, Monte Carlo calculation, 9: 4254

scattering angle of, from Bi^{210}, in nuclear emulsions, 9: 715(J)

scattering by a point charge, Dirac solutions, 9: 1139

Electrons (cont'd)
scattering of, atomic factors in, 9: 2033(J)
scattering of high-energy, by polarized nuclei, 9: 2049(J)
scattering of high-energy, in crystals, 9: 2495(J)
scattering of 192-Mev, by D, 9: 4305(J)
scattering of 0.6-, 1.0-, and 1.7-Mev, from Al and Au, 9: 2485(J)
scattering phase shifts, theory, 9: 1067(R)
secondary production of, by Cd ions on Cd and Hg ions on Hg, 9: 1562(J)
scattering of, radiative corrections to, 9: 3317(J)
scattering of 6.6-, 11.5-, and 18.0-Mev, in photographic emulsions, 9: 2942(J)
secondary, spatial distribution of energy dissipation by, from high-energy x rays, 9: 422(J)
source scattering of, angular correlation of, 9: 1382(J)
specific ionization of H_2, He, and N_2 by high-energy, 9: 3315(J)
sterilization of pharmaceuticals and radiation effects on plastics, 9: 2053(J)
"subexcitation" from ionization processes, roles in radiation effects, 9: 2819(J)
three-photon annihilation of electron-positron pairs, 9: 669(J)
velocity measurement method for high-energy, 9: 1305(J)
Electrophoresis
combined with specific-activity determination in determinations of radiochemical purity, 9: 3262(J)
paper, manual, 9: 3076(J)
paper, recording integrating photoelectric and radioactive scanner, 9: 2393(J)
Electrophotography
evaluation of xeroradiography, 9: 3816
Electrostatic fields
(See also Electromagnetic fields.)
distortion produced in guarded, by grounded external plates, measurement, 9: 314(J)
Electrostatic generators
(See also Van de Graaff Accelerators.)
current indicator and integrator for, development, 9: 2099(R)
design and performance of highvoltage, 9: 998(J)
portable Van de Graaff, 9: 1559(J)
Electrostatic lenses
calculation of, from paraxial focusing properties, 9: 1939(J)
for relativistic particles, theory, 9: 2379(J)
Electrostatic lenses
spherical aberration in, correction systems for, 9: 3581(J)
Electrostatic precipitation
theory, applied to deposition of aerosol particles, 9: 934
Electrostatic precipitators
performance, 9: 934
performance of, effect of electrical charge of particles, 9: 3557(J)
portable, design, 9: 607(J)
Element ninety-nine
chelation with thenoyltrifluoroacetone, 9: 924(J)
Element one hundred isotopes 100^{254}
gamma spectra, 9: 4319(J)
Elementary particles
(See also specific particles, e.g., Mesons and V particles; see also Bosons; Fermions.)
charge dependence relations and mass spectrum of, 9: 2002(J)
decay into two particles with zero mass, theory, 9: 1420(J)
effects of oscillation of meson shell of nucleons on probability of particle interaction, 9: 458(J)
Elementary particles (cont'd)
effects of potential gradient on the density of a degenerate Fermi gas, 9: 4338(J)
effects of radiative corrections on a charged spin ½ particle in a constant magnetic field, 9: 4340(J)
equation for particles with spin two, 9: 3351(J)
mass of, theoretical calculation, 9: 459(J)
mass spectrum, 9: 2007(J)
multiple scattering, mass determination by, 9: 3327(J)
new type spin-½, interaction with external field, 9: 2534(J)
photodisintegration, 9: 4006(J)
with spin ½, absence of discrete energy levels and cohesive states in, in fixed pseudoscalar potential field, 9: 460(J)
strong coupling with meson fields, theory, 9: 1691(J)
Elements
abundance of, in the earth's crust, 9: 1830(J)
chemical properties, effect of electronic configuration on, 9: 876
heats of sublimation at 289°K, 9: 2137
isotope shift in x-ray spectra of heavy, 9: 1414
x-ray critical-absorption and emission energies in kev, table, 9: 3227(J)
Elk Ridge Quadrangle (Utah)
photogeologic map of, 9: 3467(J)
Embryos
chick, incorporation of carbonates and formates into, effects of x irradiation on, tracer study, 9: 3376
chick, LD_{50} determinations, 9: 822(J)
developing, of Artemia, radiosensitivity, effects of hydration, 9: 3741(J)
developing, pathological effects of particles on, in rats, 9: 19
effects of x irradiation, 9: 2547(R)
gamma radiation effects on development of frog, 9: 2581(J)
gross pathological effects of x radiation on, of frogs, 9: 820
metabolism in, effects of radiation on, in grasshoppers, 9: 495(J)
Emery Quadrangle (Utah)
photogeologic map of, 9: 3833(J)
Emesis
radioinduced, in dogs, 9: 16
Emission spectra
of metal surfaces, theory, 9: 2741
Emissivity
measurement, apparatus for, 9: 2793(R)
Emulsions
(See also Nuclear emulsions; Photographic emulsions.)
development of, due to self nucleation, 9: 2800(J)
Enanthaldehyde
adsorption on Cu from aqueous solutions as inferred from H_2 overvoltage measurements, 9: 595(J)
Enanthic acid
adsorption on Cu and Ag from aqueous solutions as inferred from H_2 overvoltage measurements, 9: 595(J)
Engineering Research Inst. Univ. of Mich.
progress reports on creep and rupture behavior of Ti and Ti alloys, 9: 2275(R), 2279(R), 3473(R), 3479(R)
progress reports on fatigue properties of Ti, 9: 3842(R)
progress report on influence of surface treatment on fatigue properties of Ti and Ti alloys, 9: 962(R)
progress reports on spectrochemical analysis of Ti and Ti alloys, 9: 639(R)
progress reports on study of creep of Ti-75A, RC-130A, and Ti-150A, 9: 168(R)

Engineering Research Inst. Univ. of Mich. (cont'd)

progress reports on utilization of gross fission products, 9: 1550(R)

Engle Area (N. Mex.)

geophysical exploration, 9: 2709

Entrada Formation (Utah)

geology of, 9: 160

Entrainment separators

(See Electrostatic precipitators.)

Entropy

(See also Thermodynamics.)

of fusion, relation to atomic number, 9: 3552(J)

Enzymes

action of, on nucleic acids, effects of glucose on, 9: 870(J)

activity of, effects of whole-body x irradiation on, in spleen of rats, 9: 3738(J)

alkaline phosphomonoesterase, identification, 9: 4066(J)

carboxypeptidase inhibitor, effects of whole-body x irradiation on, in mice, rats, and rabbits, 9: 3728

coenzyme A, radiosensitivity of, in rats and guinea pigs, 9: 3729

determination of acetylcholinesterase in tissues, 9: 2099(R)

effects of exposure to γ radiation on proteolytic enzyme activity of beef muscle, 9: 2116(J)

effects of irradiation on functional activity of coenzyme A, 9: 2574(J)

effects of radiation on, review in Annual Review of Nuclear Science, 9: 3733(J)

effects of radiation on, review of literature, 9: 2549

effects of radiation on adenosine triphosphatase activity, modifications produced by injected spleen homogenates, in mice, 9: 38(J)

effects of radiation on adenosine triphosphatase activity in tissue homogenates, 9: 2587(J)

effects of thrombokinase on storage of heparin by mast cells, 9: 1706(J)

effects of total-body irradiation on desoxyribonuclease activity of blood plasma in rats, 9: 2579(J)

effects of total-body irradiation on 5-nucleotidase and adenosine triphosphatase activity of hematopoietic system in rats, 9: 480(R)

effects of total-body irradiation on systems of, in rats, 9: 2548(R)

effects of total-body irradiation on urinary excretion of desoxyribonucleases in rats, 9: 23(J)

effects of total-body x radiation on adenosine triphosphatase and 5-nucleotidase activity of hematopoietic tissues, in rats and mice, 9: 14

effects of total-body x irradiation on desoxyribonuclease activity of spleen in rats, 9: 488(J)

effects of treatment with, on radiation-recovery factor in tissue homogenates of spleen and bone marrow, 9: 3370

heparin-activated, in blood plasma, properties, 9: 2540

investigations on indole-3-acetic acid oxidase, ribonuclease, and tryptophan-indoleacetic acid systems, 9: 2547(R)

liver concentrations of oxidized and reduced diphosphopyridine nucleotide, effects of total-body x irradiation on, in rats, 9: 3740(J)

localization of tryptophan–indoleacetic acid systems in leaves and effects of radiation on, 9: 3(R)

purine-metabolizing, of rat liver and spleen, effects of total-body x irradiation on, 9: 2120(J)

pyrophosphatase and adenosine triphosphatase activity of spleen and thymus effects of x irradiation on, in rats, 9: 3(R)

reaction mechanisms of, in normal and leukemic leukocytes, 9: 6

Erbium

neutron-diffraction studies of, 9: 3344(J)

tissue distribution of, in rats, tracer study, 9: 3730(R)

Erbium chlorides

crystal structure, 9: 544(J)

Erbium isotopes Er^{166}

energy levels, 9: 1405(J)

Erie Area (Nev.)

uranium distribution, 9: 1260(J)

Erythrocytes

labeled with Cr^{51}, elution of Cr, 9: 3049(J)

nucleated, uptake of Fe by, effects of irradiation on, tracer study, 9: 3011(J)

transport of potassium in, tracer study, 9: 1735(J)

transport of sodium in, tracer study, 9: 1736(J)

uptake of Fe by, effects of whole-body x irradiation on, in ducks, 9: 1158, 2580(R)

Erythropoiesis

effects of intravenously injected plasma from x-irradiated, spleen-shielded rats on, in normal rats, tracer study, 9: 3748(R)

effects of whole-body x irradiation on, and stimulation of, in dogs and rats, tracer study, 9: 3739(J)

Escherichia coli

cytological effects of ultraviolet radiation on, 9: 2107, 2108

effects of x radiation on, influence of low temperature on recovery, 9: 2562(J)

growth and cell division of, chemical inhibition, 9: 1461(J)

sensitivity of, to thermal neutrons, 9: 2099(R)

Ethane

direct fluorination, 9: 890

Ethane, bromo-

thermal decomposition of, from 350 to 450°C, C^{13} isotope effect in, 9: 2143(J)

Ethane, 1,1-difluoro-

microwave spectrum from 18,000 to 38,000 Mc, 9: 1771(J)

Ethane, fluoro-

microwave spectrum of, 9: 2184(J)

Ethane, hexafluoro-

infrared spectrometric determination of bond moments in, 9: 2183(J)

Ethane, pentafluoro-

infrared and Raman spectra of, 9: 2652(J)

Ethane, trichloro-

atomic electric moments, dielectric constants and polarization of, 9: 3059(J)

Ethanes, chlorofluoro-

atomic electric moments, dielectric constants and polarization of, 9: 3059(J)

Ethanes, halo-

chlorinated and fluorinated derivatives of, torsional barriers in, 9: 1784(J)

Ethanethiol, 2-amino-

protective effects of, against radiation injuries in mice, 9: 2121(J)

in therapy of radiation sickness, 9: 3036(J)

Ethanol, 2,2-iminodi-

neutralization titrations of, in anhydrous pyridine, 9: 882(J)

Ethanol, triphenyl-

mechanism of Wagner-Meerwein rearrangement in, 9: 1755(J)

Ether, bis(chloroethyl)

solvent properties for Hg, 9: 1066(R)

Ether, chloromethyl methyl

atomic electric moments, dielectric constants and polarization of, 9: 3059(J)

Ethyl ether complexes

with boron trifluoride, reaction with lithium, borohydride and trimethoxyborine, 9: 3055

with boron trifluoride and boron trichloride, electrolytic decomposition, 9: 516

Ethyl isocyanide

direct fluorination, 9: 890

Ethylamine, 2-mercapto-
(See Ethanethiol, 2-amino-.)

Ethylene
deuterium-labeled, vibrational spectra and constant potential energy, 9: 345(J)
effects of γ radiation, 9: 583(J)
ion pair formation, 9: 4039(R)
radioinduced polymerization of, 9: 1550(R)
vibrational spectra and constant potential energy, 9: 345(J)

Ethylene–argon systems
viscosity of, at 25°C, 9: 3213

Ethylene, chloro- polymers
electric resistance, 9: 3889(R)

Ethylene, chlorotrifluoro-
Raman spectra, 9: 1137(J)

Ethylene, chlorotrifluoro- polymers
compression of, at high pressures, temperature dependence, 9: 863(J)

Ethylene, fluoro-
polymers, compression of, at high pressures, temperature dependence, 9: 863(J)
vibrational spectra of $CF_2 = CHD$ and $CF_2 = CD_2$, 9: 1770(J)

Ethylene glycol
yield from decomposition of methanol by Co^{60} gamma radiation and 28-Mev He ions, 9: 2202(J)
yield from decomposition of methanol–water solutions by Co^{60} gamma radiation, 9: 2203(J)

Ethylene glycol systems
electric conductivity and anodic corrosive effects on Ta, 9: 230

Ethylene polymers
Polythene
(See Ethylene polymers.)
compression of, at high pressures, temperature dependence, 9: 863(J)
effects of β particles on, 9: 2664(J)
ranges of electrons in, Monte Carlo calculation, 9: 4254
welding techniques and nondestructive testing, 9: 3760

Ethylene, tetrachloro-
radiosensitivity of mixtures of chloroform and, 9: 4241(R)

Ethylene, tetrafluoro- polymers
compression of, at high pressures, temperature dependence, 9: 863(J)
effects of β particles on, 9: 2664(J)
three-quantum annihilation of positrons in, 9: 249(J)

Ethylenediaminetetraacetic acid
(See Acetic acid, (ethylendiamine)tetra.)

Ethylenimine
direct fluorination, 9: 890

Euglena
carbon dioxide metabolism, tracer study, 9: 2136(R)

Eureka Area (Alaska)
uranium distribution in, 9: 1523(J)

Europium
chelation with thenoyltrifluoroacetone, 9: 924(J)
radiochemical determination, 9: 876
tissue distribution of, in rats, tracer study, 9: 2551(R)

Europium ions
separation by ion exchange, 9: 910(J)
spectra, theory of, 9: 2978(J)

Europium(III) ions
orientation in CaF_2 crystals, 9: 1934(J)

Europium isotopes
tracer techniques in agitators of U pilot leach plant, 9: 2261

Europium isotopes Eu^{151}
neutron resonance widths, 9: 4039(R)
nuclear spin and Eu^{151}/Eu^{153} magnetic moment ratio, 9: 2904(J)

Europium isotopes Eu^{152}
decay schemes, 9: 439(J)

Europium isotopes Eu^{153}
decay schemes, 9: 988(R)
energy levels, 9: 1683(J)
nuclear spin and Eu^{151}/Eu^{153} magnetic moment ratio, 9: 2904(J)

Europium isotopes Eu^{154}
decay schemes, 9: 439(J)

Europium isotopes Eu^{155}
fission yield of, from natural U, 9: 1700(J)

Evaporation
of water, pressures and rates of, 9: 937

Evaporators
(See also Distillation apparatus.)
design and operation of remotely controlled surface, for routine analytical work, 9: 100(J)
high-pressure wetted-wall, performance, 9: 937

Experimental breeder reactors
design, 9: 757(J), 3294(J)

Exploration
(See also appropriate subheadings under specific materials sought.)
book on methods for, of U, Th, and Be, 9: 960(J)

Explosions
(See also Atomic explosions; Detonation waves; Shock waves; Thermonuclear explosions.)
detonation velocity, measurement by microwave resonator techniques, 9: 4264
involving commercially pure Ti and red-fuming nitric acid, 9: 3456(J)
reaction zone of, mathematical analysis, 9: 1905
relation between velocity and radius of curvature of detonation wave in, 9: 995(J)
rotating-mirror framing camera for photographing, 9: 2384

Explosives
condensed, diameter effect in relation between velocity and radius of curvature of detonation wave, 9: 995(J)
crystal size of, influence on explosions, 9: 2498(J)
effects of radiation on, 9: 2498(J)
explosive properties of polyvinyl nitrates, 9: 1747(J)

Exponential piles
neutron flux variation with number of fuel elements present, 9: 2445
thermal neutron distribution from fast sources in, theory, 9: 368

Exposure chambers
(See Radiation exposure chambers.)

Extensometers
(See also Strain gages.)
design of, 9: 1820(R)

Extraction apparatus
(See also Packed columns; Pulse columns; Scrubbers.)
centrifugal extractor, operating characteristics, 9: 1212
design, flow capacity, and mass transfer, review, 9: 3105(J)
design and performance of horizontal liquid-liquid, 9: 2208
design and performance of semiautomatic, for gas separation, 9: 2211(J)

Extrusion
design of equipment for low-density foamed Al–Mg alloys, 9: 3182
design and performance of equipment for Ti alloy, 9: 2276(R)
exaggerated grain growth in, 9: 1545(J)
power requirements in, theoretical determination, 9: 4193(J)
theory, 9: 4190(J)

Eyes

chorioretinal burns of, produced by atomic flash, 9: 3026(J)

effects of radiation, 9: 3722, 3723, 3724, 3725

erupt, radioinduced, in Drosophila, 9: 3022(J)

induction of cataracts by exposure to β particles, 9: 2118(J)

neoplasms of, differential uptake of P^{32} in diagnosis, 9: 49(J)

radioinduced cataracts of, mechanisms of production in rabbits, 9: 494(J)

F

Fairhaven Creek Area (Alaska)

uranium distribution in, 9: 1523(J)

Fall Creek Prospect (Idaho)

uranium distribution in, stratigraphy, 9: 2263

Fall-out

gamma radiation from, effects of environmental factors on reduction, 9: 2590

monitoring, following Operations Hurricane and Totem, 9: 35(J)

Far West Willys Group (Nev.)

exploration, geology, and mineralogy, 9: 1516(J)

Fast neutrons

biological effects of, compared with effects of γ radiation on cataract formation in mice, 9: 3(R)

detection and measurement, comparison of tissue-equivalent ion chambers and recoil proportional counters for, 9: 3951(J)

detection and measurement of, monitor design, 9: 3934

detection and measurement of, use of reaction $T(d,n)He^4$ for comparison of methods for, 9: 3985(J)

detection using the S^{32} (n,p) P^{32} reaction, 9: 3927

dosimeter for, operating characteristics, 9: 3252

dosimetry, 9: 2539(R)

dosimetry, performance of chemical radiation detectors for, 9: 700

effects of exposure to, on barley seed, 9: 3369(J)

genetic effects of, compared with effects of x radiation in Drosophila, 9: 824(J)

lethal dosage determinations for mice, 9: 2547(R)

moderation in SiO_2 and $CaCO_3$, 9: 3999(J)

polarization, review, 9: 1400(J)

Fatigue

criterion for minimum scatter in, 9: 1816

equipment for testing, 9: 2238

methods of measurement, 9: 3855(R)

statistical theory of size and shape effects in, 9: 1815

theory of fatigue failure under combined stress, 9: 4159

Fatty acids

effect of ionizing radiation on essential, in aqueous media, 9: 106

Feedback systems

books, "Feedback Control Systems," 9: 3228(J)

frequency-response method applied to automatic control, bibliography, 9: 287(J)

Fermions

colliding, relativistic wave functions of, 9: 816(J)

effects of potential gradient on the density of a degenerate Fermi gas, 9: 4338(J)

renormalization of a neutral vector meson interaction with, 9: 1694(J)

Ferroin

effects of γ radiation, 9: 3267(J)

Fertilizers

production of, from Florida leached zone material, 9: 1183(R), 1746(R)

Fibrinogen

native and urea-denatured, hydrodynamic properties, 9: 859(J)

Field theory

(See also Nuclear theory; Quantum electrodynamics.)

absence of discrete energy levels and cohesive states of particles with spin $\frac{1}{2}$ in fixed pseudoscalar potential fields, 9: 460(J)

coupled meson and nucleon fields, lattice space quantization, 9: 2992

equations of self-consistent fields for nuclei by calculation of electrostatic force, 9: 456(J)

interaction of two quantized fields, 9: 4030(J)

interactions of free nucleons, 9: 2091(J)

meson, of strong coupling of nucleons, 9: 1421(J)

quantized, relation of functional analysis to Hamiltonian approach to strong coupling, 9: 3703(J)

quantum, causal operators in, 9: 2093(J), 2094(J)

quantum, introduction of dynamic variables in, 9: 4029(J)

quantum, mass and charge renormalization in covariant equations of, 9: 2092(J)

quantum, with nonlocal interaction, unitarity of S matrices in, 9: 2994(J)

renormalization of a covariant approximation scheme in, 9: 2998(J)

strong-coupling, for case of pseudoscalar coupling, quantization of, 9: 3705(J)

tensor forces dependent on velocity, 9: 815(J)

variable mass equations of, 9: 3349(J)

Films

(See also specific films as identified by material.)

effect of angle of inclination and mass flow rate on heat-transfer coefficient of falling liquid, design data, 9: 3133(J)

formation on metals and alloys, mathematical analysis, 9: 3884(J)

halide ion-sensitive, for water aerosols, 9: 1001(J)

preparation of thin, of Pu and U, 9: 3945(J)

Filter materials

(See also specific filter materials, e.g., Asbestos; Glass wool.)

efficiency of, in removal of monodisperse solid aerosols, 9: 531

Filter papers

electroösmosis in, employing electrochromatography with electrode vessels, 9: 1220(J)

electroösmosis of lactic acid solutions in, employing electrochromatography with electrodes on paper, 9: 1221(J)

lignin, effectiveness of, for removal of dust and microörganisms from air of inhabited rooms, 9: 3361(J)

Filters

(See also Gas mask canisters; Traps; Water purification equipment.)

air, table of disposable, 9: 3090(J)

glass fiber, for filtering radioactive aerosols, 9: 1491

performance of, for radioactive-dust collector, 9: 1801(R)

Finned tubes

heat transfer by free convection from, 9: 1808

Fires

(See also Sodium fires.)

prevention, nuclear detector for, 9: 2832(J)

Fish

radiothyroidectomy of salmon parr, following ingestion of I^{131}, 9: 828(J)

Fission

asymmetry of, and spatial conception of nuclear levels, 9: 745(J)

(See also Nuclear reactions; Spallation; Spontaneous Fission.)

fine structure in yield of, in mass region 99 to 106, 9: 670(J)

mass and charge distribution in thermal, review, 9: 3791(J)

Fission chambers

(See also Ionization chambers.)

design and operation, 9: 3257(J)

design of fast, for fission counting, 9: 1971(J)

Fission chambers (cont'd)
electrical characteristics, 9: 3258(J)
preparation of thin Pu and U films for, 9: 3945(J)
Fission products
(See also Fall-out; Radioisotopes.)
adsorption of, on montmorillonite clay, 9: 1234
adsorption on montmorillonite as waste disposal process, 9: 929(J)
chemical and industrial applications, 9: 579(J)
detection and measurement, by Kanne chamber, 9: 1038
determination of, in irradiated U, performance of γ spectrometer for, 9: 3264(J)
gamma decay after reactor shutdown, 9: 3977
gamma radiation from, 9: 2983
handling of spent MTR fuel rods, for radiation sources cost factors, 9: 3122
industrial use of spent MTR fuel rods as γ sources for radiosterilization of foods, and drugs, cost factors in, 9: 3122
ionization by, and industrial uses, 9: 3208(R)
ionization by α particles and fission fragments, 9: 2821
mass spectrographic analysis utilizing crossed electric and magnetic fields, 9: 4246
from Operations Hurricane and Totem, uptake by plants and animals, 9: 35(J)
particle size measurement of aerosols of, 9: 819
production of electric power from, survey of methods for, 9: 3716(J)
as radiation sources for use in radiation chemistry and food treatment, 9: 1550(R)
radiometric analysis of, standardization, 9: 4244
rare-earth, rapid separation of, by ion exchange with lactic acid as eluant, 9: 3427(J)
recovery from waste solutions, 9: 2099(R)
response of NaI(Tl), KI(Tl), and stilbene to, 9: 1606
separation and radiometric analysis, 9: 876
separation and radiometric determination of, from contaminated soil, 9: 534
separation plants and procedures, 9: 590(J)
uptake of, by plants from contaminated soil, pathological effects of, 9: 9
utilization in food sterilization, 9: 1702(J)
Fission recoils
chemical effects in, 9: 3422(J)
Flash burns
(See Burns.)
Flat Top Mesa Area (Utah)
mineralogy, 9: 1829
Flavonoids
chemical properties and physiological effects, 9: 3388(J)
chromatographic separation of, from tobacco leaves, 9: 3(R)
effects of therapy with, on radiation injuries in cancer patients, 9: 839(J)
Flocculation
fundamental studies of, application of infrared spectroscopy to, 9: 50
Florida
map of geophysical exploration of Fort Myers Area in Charlotte and Lee counties, 9: 1526
map of geophysical exploration of the Gardner Area in De Soto, Hardee, Manatee, and Sarasota counties, 9: 1832(J)
Florida (Nassau Co.)
map of geophysical exploration of Folkston Area in, 9: 1831(J)
Florida leached zone material
colorimetric determination of Al in, 9: 880
fertilizer production from, 9: 1183(R)
processing of, for nitric phosphate fertilizer, 9: 1746(R)
Flotation
bubble–mineral attachment in, theoretical analysis of, 9: 148(J)
Flotation (cont'd)
fundamental studies of, application of infrared spectroscopy to, 9: 50
review, 9: 3161(J)
Flotation reagents
review, 9: 3161(J)
Flowmeters
(See also Fluid flow; Gas flow; Liquid flow.)
design and performance of electromagnetic, 9: 3810
design of multi-range, 9: 2196(J)
electromagnetic, calibration, 9: 4179(R)
micro-, for gas flow measurements, design and calibration, 9: 2655
operation and performance, literature survey on, 9: 2699(J)
Fluid flow
(See also Compressible flow; Convection; Gas flow; Incompressible flow; Liquid flow; Plastic flow; Subsonic flow; Supersonic flow; Transonic flow.)
break-away cavitation behind cylinder, mathematical analysis, 9: 3127(J)
in closed system of steam-generating pipes, deposition of salts and temperature distribution, 9: 3449(J)
density gradient in, effect on Taylor instability, 9: 3446
dynamics of, review, 9: 3136(J)
gas-liquid, in vertical tubes, 9: 2234(J)
of gas-liquid mixtures in horizontal pipes, 9: 4133(J)
heat transfer and pressure drop of, in starting area of air-passed slots, 9: 2230(J)
heat transfer in a long cylindrical cell, 9: 4128
interface instability of the Helmholtz type, 9: 138
laminar-turbulent, transition phenomena in pipes and annular cross sections, 9: 3131(J)
mechanism of, 9: 1237
pressure and erosion in cavitation region, 9: 1241(J)
pulsating, literature survey on measurement of, 9: 2699(J)
review, 9: 3134(J)
shapes of cavitation region on a transverse foil in a normally incident stream, 9: 3128(J)
structure of the cavitation region, 9: 1240(J)
Fluid flow (laminar)
analyses for free convection in fluids having a volume heat source, 9: 1492
effects of, on absolute rates of dissolution, 9: 3448(J)
free and forced convection heat transfer, 9: 2229
motion in boundary layer near line of intersection of two planes in viscous incompressible, 9: 4134(J)
Fluid flow (turbulent)
calculation of resistance in, 9: 1812(J)
deflection of non-uniform streams, mathematical analysis, 9: 1803
effects of, on absolute rates of dissolution, 9: 3448(J)
with heat transfer at smooth walls, mathematical analysis, 9: 3126
heat transfer film coefficient of water suspensions in, containing solids of high thermal conductivity, 9: 2236(J)
mass and heat transfer with, analogy between, 9: 4132
motion in boundary layer near line of intersection of two planes in viscous incompressible, 9: 4134(J)
in pipes, general heat transfer law, 9: 3447(J)
velocity and pressure distribution in pipes, 9: 3445
vorticity and deformation in, kinematical properties of, 9: 1494(J)
Fluids
(See also Body fluid; Hydraulic fluids.)
interface instability of the Helmholtz type, 9: 138
molecular transport properties of, review, 9: 3135(J)
Fluid reactor fuels
(See Reactor fuel alloys (liquid).)

Fluoborates
dissociation of, in anydrous hydrofluoric acid, 9: 866(J)

Fluoranthenes
perfluorination of, 9: 2650

Fluorescence
(See also Luminescence; Phosphorescence.)
energy conversion during, 9: 3275
of liquid phosphors, increasing efficiency of, 9: 3952(J)
radiation-induced, in organic solutions, 9: 4316(J)

Fluoride complexes
formation in fluosulfonic acid, 9: 3416(J)
studies on Cu, Zn, Ag, and Hg, 9: 2136(R)

Fluorides
atmospheric, determination following ion-exchange separation, 9: 1776(J)
colorimetric determination of, in urine, 9: 4076
microchemical detection of, in organic and inorganic substances by Na fluosilicate crystal test, 9: 3412(J)
microwave absorption cell for, design and construction, 9: 1062(J)
pyrohydrolytic determination of, design of apparatus for, 9: 3411(J)
urinary excretion of, effects of renal tubular injury, 9: 1730(J)

Fluorination
design and performance of a jet reactor for, 9: 890

Fluorine
absorption by NaF, 9: 3082
chemical and physical properties, molecular dissociation, viscosity, thermal conductivity, and rate of dissociation, 9: 894(J)
combustion determination in highly fluorinated organic compounds, 9: 2186(J)
corrosive effects on metals by alternate exposure to liquid and gaseous fluorine, 9: 4142
effects of dietary, on bone deposition of S in swine, 9: 1156(R)
elastic scattering of protons by, 9: 796(J)
in electrolytic deposition of zinc, effect of, 9: 891(J)
energies of K transitions of π-mesonic x rays from, 9: 1909(J)
intermolecular forces and virial coefficients, 9: 3081
metabolism of, by thyroid gland, 9: 2610(J)
metabolism of, in domestic animals, tracer study, 9: 1156(R)
proton reactions, 9: 1349(J)
reaction kinetics of, in fluorination of UF_4 for preparation of UF_6, 9: 3385
semimicro determination in organic compounds, 9: 2166(J)
vasodepressor action of, in dogs, 9: 3046(J)

Fluorine compounds
molar refractions and refractive indices, 9: 546
organometallic and organometalloid, preparation of, 9: 803(J)

Fluorine isotopes F^{19}
activation determination with α source, 9: 1650(J)
alpha reactions, 9: 1362(J)
Coulomb excitation by α particles, 9: 1362(J)
Coulomb excitation functions for and energy levels for, bombarded with 3.5-Mev α particles, 9: 423(J)
deuteron reactions (d,γ), energy and intensity of γ rays from, 9: 379(J)
energy levels, 9: 1349(J), 3679(J)
energy levels from Ne^{19} and O^{19} decays, 9: 363(J)
gamma reactions (γ,2p), N^{17} yield curve from, 9: 3644
inelastic scattering of protons by, γ radiation from, 9: 3679(J)
nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)
proton reactions (p,γ) and (p,$\alpha\gamma$), study of γ rays from, 9: 2916(J)
shell theory for, and other A = 19 nuclei, 9: 4267(J)
thermonuclear reactions of protons with, in stars, 9: 3647(J)

Fluorocarbon polymers
preparation and properties, 9: 1487(R)
synthesis of difluoroacetylene polymer by stripping, 9: 3082

Fluorocarbons
bond dissociation energies, 9: 1772(J)

Fluorohydrocarbon polymers
preparation and properties, 9: 1487(R)

Fluoroörganic compounds
acetylation, chloromethylation, alkylation, chlorosulfonation, and iodination of tetrafluorobenzene, 9: 3082
combustion determination of C and F in highly fluorinated, 9: 2186(J)
Grignard and modified Ullman reaction of dibromotetrafluorobenzene, 9: 3082
lithium exchange reaction of diiodotetrafluorobenzene, 9: 3082
molecular electric dipole moments, 9: 547
polymerization, 9: 1487(R)
polymerization of 3,3,3-trifluoro-1,2-epoxypropane and 2-methyl-3,3,3-trifuloro-1,2-epoxypropane, 9: 1767(R)
synthesis, 9: 4091(R)
synthesis of 3,3,4,4,5,5,5-heptafluoro-2-pentanol, 2-methyl-3,3,3-trifluoro-1,2-epoxypropane, and 3,3,3-trifluoro-1,2-epoxypropane, 9: 1767(R)

Fluoroörganic polymers
synthesis, 9: 1767(R)
synthesis and properties of fluorinated polydienes and polyacrylates, 9: 3083(R)

Fluorothene
(See Ethylene, chlorotrifluoro- polymers.)

Fluorspars
(See also Calcium fluorides.)
acid leaching and U recovery from, from Thomas Range, Utah, 9: 139

Fluosulfonic acid
ionization in anhydrous, and formation of complex fluorides in, 9: 3416(J)

Fluxmeters
design for measurement of nuclear resonance, 9: 1618

Fog
oil, sampling program, 9: 2099(R)

Foils
(See also specific foils as identified by material; see also Films.)
effect of orientation on neutron-induced activity, 9: 2857(J)

Folkston Area (Fla.–Ga.)
geophysical exploration, map of, 9: 1831(J)

Food
effects of γ radiation on storage life of onions, 9: 3735(J)
effects of irradiation on activity of proteolytic enzyme and leposidase-type enzyme systems, 9: 10(R)
effects of radiation on refrigerator and shelf storage-life and taste qualities, 9: 1550(R)
gamma irradiation of beef, nature of odors formed during, 9: 2117(J)
irradiated meat, effect of dietary on growth of rats and puppies, 9: 1116
processing of, by electrons from traveling-wave linear accelerators, 9: 1369(J)
radiation processing of, effects of gases, temperature, and composition of food material, 9: 1715(J)
radiation sterilization of, industrial attitude toward, 9: 1714(J)
radiosterilization, 9: 10(R)
radiosterilization of, by γ radiation, 9: 11
radiosterilization of, review of literature, with emphasis on effects of radiation on meats, 9: 2549
sterilization by radioactive waste products, 9: 1702(J)
sterilization of, induced by γ irradiation, role of radioresistance of bacterial spores, 9: 33(J)

Food (cont'd)
sterilization of pork by γ radiation, 9: 493(J)

Foote Mineral Co.
progress reports on ground zirconium metal powder pilot plant, 9: 1853(R)

Forging
inert gas, equipment for, 9: 984(J)

Formaldehyde
yield from decomposition of methanol by Co^{60} gamma radiation and 28-Mev He ions, 9: 2202(J)
yield from decomposition of methanol–water solutions by Co^{60} gamma radiation, 9: 2203(J)

Formamide, N,N-dimethyl-
direct fluorination, 9: 890
solubility in sodium borohydrides, chemical reactions, and optical properties, 9: 2615

Formamide, N,N-dimethyl- –boronfluoride systems
chemical and thermal properties and reduction, 9: 2615

Formamide, N,N-dimethyl- –sodium borohydride systems
electrolysis, 9: 2615

Formates
incorporation of, in nucleic acid components, effects of injected bone marrow in rats, tracer study, 9: 1176
incorporation of, into normal and x irradiated chick embryos, tracer study, 9: 3376

Formic acid
neutralization titrations in anhydrous, 9: 523(J)
neutralization titrations of, in anhydrous pyridine, 9: 882(J)
reaction between cerium(IV) ions and, in aqueous solutions due to x-ray irradiation, 9: 3792(J)
solid γ-irradiated, paramagnetic spectra, 9: 3423(J)

Forney District (Idaho)
exploration for U and Th deposits in, 9: 1520(J)

Fort Myers Area (Fla.)
geophysical exploration, map of, 9: 1526(J)

Fort Union formation (Wyo.)
geology, 9: 627(J)

Fortymile district (Alaska)
geology and exploration, 9: 628(J)

Francium isotopes Fr^{221}
radioactivity and energy levels, 9: 2500

Francium isotopes Fr^{223}
separation from Ac by paper chromatography, 9: 1225(J)

Fracture tests
mechanisms of crack propagation, 9: 644(J)

Free Enterprise Mine Area (Mont.)
exploration and geology, 9: 1519(J)

Frequency regulators
nuclear magnetic resonance apparatus for production of frequencies, 9: 353

Frey Canyon District (Utah)
mineralogy, 9: 1829

Friction
rolling, apparatus for measuring, 9: 2240(J)

Frits
(See also specific materials.)
composition, preparation, properties, and testing of, for high-temperature alloy parts in nuclear reactors, 9: 2249(J)

Frogs
gamma radiation effects on ovulation, fertilization, and embryonic development in, 9: 2581(J)

Fuel alloys (liquid)
(See Reactor fuel alloys (liquid).)

Fungi
radioinduced mutations in, 9: 29(J)

2-Furaldehyde–water systems
mass transfer in a horizontal liquid-liquid extraction tube, properties affecting the film coefficients of, 9: 2208

Furnaces
design and performance of tungsten-coil, for x-ray diffraction investigation of phase changes and equilibria at high-temperatures, 9: 2319(J)
design of high-frequency, sintering, 9: 2740
design of micro, 9: 514
design of Verneuil, for producing inorganic crystals with high crystallization temperature, 9: 1932(J)
for diffusion and conductivity measurements, design, 9: 1283
diffusion-anneal, incorporating shear cells for study of diffusion in molten Pb–Bi systems, 9: 179
high-temperature laboratory, bibliography and description, 9: 1213

Fused salts
(See also specific compounds and systems.)
activity of $CaCO_3$ in mixtures of, 9: 1744
corrosive effects on Ti, 9: 1255(J)
electric conductivity, 9: 2139(J)
enthalpy and thermal capacity, 9: 1466(R)

G

Gadolinium
filament activation, 9: 2794
heat of combustion, 9: 4023(J)
hyperfine structure, 9: 1686(J)
tissue distribution of, in rats, tracer study, 9: 3730(R)

Gadolinium compounds
paramagnetic absorption in salts of, in parallel fields, 9: 2516(J)

Gadolinium isotopes Gd^{155}
decay schemes, 9: 988(R)
nuclear magnetic moments and spin, 9: 1686(J)

Gadolinium isotopes Gd^{157}
nuclear magnetic moments and spin, 9: 1686(J)

Gadolinium isotopes Gd^{159}
fission yield of, from natural U, 9: 1700(J)

Gadolinium nitrates
preparation of anhydrous, by reaction of oxides and NO_2, 9: 112(J)
solvent partition of, between nitric acid and tributyl phosphate, 9: 901

Gadolinium oxide crucibles
preparation and properties of, for molten Ti, 9: 2246

Gadolinium oxide–titanium systems
hardness and microstructure, 9: 2246

Gadolinium oxides
heat of formation, 9: 4023(J)
properties of, effect of molten Ti on, 9: 2246

Gadolinium sulfates
paramagnetic absorption in, in parallel fields, 9: 2516(J)

Gages
(See also Pressure gages; Strain gages; Thickness gages; Vacuum gages.)
application of radioisotopes to, 9: 1334(J)

Gallates
crystallography of rare-earth, 9: 2982(J)

Galling
and seizing, prevention of, 9: 2745(J), 2746(J)

Gallium

bremsstrahlung reactions at 320 Mev, interpretation of results, 9: 3654(J)

bremsstrahlung reactions at 320 Mev, nuclide yields from, 9: 3653(J)

extraction by organic solvents from aqueous HCl, 9: 4205(R)

radiometric determination, 9: 2634

solubility of, in molten $GaCl_3$, 9: 3052

spectrographic determination of, in ores and rocks, 9: 162

volumetric determination, 9: 74(J)

Gallium chlorides (liquid)

solubility of Ga in, 9: 3052

Gallium iodides

preparation, phase studies, oxidation states, melting point determinations, and x-ray-diffraction powder patterns of GaI_3-GaI_2-GaI system, 9: 3053

solvent extraction of GaI from GaI_3-GaI_2-GaI system with CaH_2-dried benzene, 9: 3053

Gallium isotopes

gamma spectra of, 9: 435(J)

Szilard-Chalmers concentration, 9: 1959(J)

Gallium isotopes Ga^{67}

half life, 9: 2960(J)

Gallium isotopes Ga^{69}

electromagnetic separation, 9: 1591

nuclear magnetic moments, 9: 652(R)

nuclear magnetic octupole moments, measurement, 9: 359(J)

Gallium isotopes Ga^{71}

electromagnetic separation, 9: 1591

nuclear magnetic moments, 9: 652(R)

nuclear magnetic octupole moments, measurement, 9: 359(J)

Gallium oxides

heat and free energy of formation, 9: 529(J)

Gallup Area (N. Mex.)

geophysical exploration, 9: 2709

mineralogy, 9: 1829

Gamma absorption coefficients

graphs for various materials, 9: 2983

tables, 9: 2472

Gamma decay

intensity rules for, to rotational states, 9: 2501

internal Rayleigh scattering in, 9: 3310(J)

of neutral pions, damping effect in, 9: 336(J)

Gamma radiation

(See also appropriate subheadings under specific materials; see also Photons; X radiation.)

absorption by nuclei, 9: 4006(J)

angular correlations of pairs in multiple cascades, theorem on, 9: 4321(J)

angular correlations, theory, 9: 434

angular distribution and polarization, formulas, 9: 3324(J)

angular distribution of, from $C^{12}(p,\gamma p')C^{12}$ reaction, 9: 2455(J)

attenuation of, 9: 2983

attenuation in 2π shield, 9: 2030

biological effects of, compared with effects of fast neutrons on cataract formation in mice, 9: 3(R)

calorimetry, 9: 1972(J)

chromosome breakage following exposure to, in Tradescantia, 9: 2576(J)

from cobalt^{60}, absolute measurement, 9: 1978(J)

from cobalt^{60} teletherapy unit, integral dose measurements, 9: 1979(J)

Gamma radiation (cont'd)

coherent scattering of, by K electrons in heavy atoms, method for evaluating, 9: 2479(J)

in coincidence with β particles, β spectrometer for study, 9: 718(J)

decomposition of methyl alcohol–water solutions by, 9: 2203(J)

decomposition of water following exposure, 9: 2660(J)

detection and measurement, 9: 1602

detection and measurement, cobalt glass and Ag-activated phosphate glass in, 9: 3932

detection and measurement, design of a thermoluminescent dosimeter for, 9: 1964

detection and measurement of, above 50 Mev, scintillation counters for, 9: 1053(J)

detection and measurement of, by γ spectroscopy, 9: 874(J)

detection and measurement of, from inhaled Rn, 9: 3591(J)

detection and measurement of, from Zn^{65} in animal tissues, 9: 3379(J)

detection and measurement of, in intense radiation fields, ion chamber for, 9: 3926

detection and measurement of, over a wide band of energies performance of a photographic film detector, 9: 1318

detection and measurement of, performance of dosimeters containing sensitized KBr crystals, 9: 3922

detection and measurement of, performance of scintillation detectors, 9: 3931(R)

detection and measurement of, performance of sensitized KBr crystals as dosimeters, 9: 4243

detection and measurement with LiF thermoluminescent dosimeter, 9: 2412(R)

detection by ortho-phenanthroline, 9: 3267(J)

from deuteron reactions with B^{10}, B^{11}, N^{14}, C^{12}, F^{19}, and Si^{30}, 9: 379(J)

directional correlations (α-γ), increased efficiency with liquid film sources, 9: 321(J)

dosage determination, 9: 3938

dosimetry, performance of chemical radiation detectors for, 9: 700

dosimetry of, using photographic film detectors, 9: 2428(J)

effects of, on chromosomes of Tradescantia, 9: 3020(J)

effects of, on liver of white rats, 9: 834(J)

effects of drill hole diameter on intensity of, in geophysical prospecting, 9: 2714(J)

effects of exposure to, on proteolytic enzyme activity of beef muscle, 9: 2116(J)

effects of repetitive exposure to, on hematopoietic system of rats, 9: 48

effects of total-body exposure to, in urine chemistry, 9: 2566(J)

effects of total-body exposure to, on respiratory quotient in burros, 9: 2572(J)

effects on cortical function in isolated calf adrenals, 9: 1166(J)

effects on ethylene, 9: 583(J)

effect on ovulation, fertilization and embryonic development in frog, 9: 2581(J)

effects on pork sterilization and trichinosis cycle, 9: 493(J)

effects on steroidogenesis in isolated calf adrenals, 9: 1165(J)

effects on storage life and taste of potatoes, 9: 2552(J)

effects on storage life of onions, 9: 3735(J)

effects on survival of Cl. botulinum spores and toxins produced by Cl. botulinum and staphylococci, 9: 474

energy absorption and ionization calculation for irradiation of ferrous ammonium sulfate solutions with, 9: 2201(J)

external detection and measurement of, from internal dose of I^{131}, 9: 1463, 1464

from fall-out, dosage determinations and effects of environmental factors 9: 2590

genetic effects of chronic exposure to, in maize, 9: 28(J)

ground scattering, Monte Carlo calculation, 9: 1375

Gamma radiation (cont'd)
high-level dosimetry of, with phosphate glass containing Co, 9: 1040
internal Rayleigh scattering of, 9: 3310(J)
from internally administered isotopes, a survey couch for use in determinations, 9: 2128(J)
isodose measurements of, over entire body following administration of 100 mc I^{131}, 9: 2605(J)
lethal dosage determinations for mice, 9: 2547(R)
lethal effects of, on Clostridium botulinum, 9: 11
line shape of monochromatic, in a scintillation spectrograph, 9: 435(J)
mapping fields of, with Ag-activated phosphate glass, 9: 3261(J)
from Materials Testing Reactor, detection and measurement, 9: 2446
Monte Carlo evaluation of single scattering integrals, 9: 2926
from nuclear explosion, late pathological effects on mice, 9: 21(J)
pair production by, conversion of intermediate-image-focusing β spectrometers for detection of, 9: 311(J)
pathological effects of chronic exposure to, on mice, 9: 2563(J)
penetration and diffusion in H_2O, 9: 3677(J)
penetration calculations and transport theory, 9: 2472
penetration of 6-Mev, in Pb and Fe, 9: 1656
physiological effects of chronic exposure to, on burros, 9: 1156(R)
from polonium neutron sources, detection and measurement, 9: 3929
polymerization of n-vinylpyrrolidone by exposure to, 9: 1781(R)
probability for emission of, from β-particle decay, 9: 1061(J)
protection against, handbook, 9: 1452(J)
radiosterilization of cheese, 9: 474
from radium and K^{40}, detection and measurement of, in vivo in human skeleton, 9: 1980(J)
relative biological effectiveness of, in mammalian systems, compared with effects of other radiations, 9: 3007
resistance of bacterial spores to, 9: 33(J)
resonance scattering of, by nuclei, 9: 783(J)
scattered, from a Co^{60} beam therapy unit, detection and measurement, 9: 2129(J)
scattering by air, spacial distribution of, 9: 1104
scattering by nucleons, calculation of cross section for, 9: 426(J)
scattering by shadow shield, 9: 2027
scattering of 0.32 mc^2, in Hg, calculation, 9: 2480(J)
from slab of contaminating material, detection and measurement, 9: 3935
simultaneous counting of, from Na^{24} and K^{42}, 9: 2429(J)
from Na^{24}, detection and measurement in body fluids, in the presence of β particles from K^{42}, 9: 1465(J)
somatic mutations produced by chronic exposure to, in carnations, 9: 4044
spectral and angular distribution of secondary, in matter, 9: 2490(J)
sterilization of beef by exposure to, nature of odors formed during, 9: 2117(J)

Gamma shielding
(See also appropriate subheadings and under the device or material shielded.)
nomographs, 9: 2983
partial, mathematical analysis of, 9: 2076

Gamma sources
calibration of, using Co^{60}, 9: 271
catalog of, 9: 246(J)
containing Co^{60}, conversion of a radium beam unit for housing, 9: 2125(J), 2126(J)
containing Co^{60}, design and handling, 9: 3923
design and calibration of 100-c Co^{60}, 9: 3896(J)

Gamma sources (cont'd)
design and cost factors for, using Cs^{137}, mixed fission products, and cooling reactor fuel elements, 9: 1550(R)
effectiveness of Co^{60} in, for interstitial, intracavitary, and plaque radiotherapy applicators, 9: 843(J)
high dose rate, for small specimens, design, 9: 2067(J)
low-level γ room for biological experiments, calibration, 9: 2547(R)
operational problems during routine use of 10-kc, 9: 432(J)
photoelectron angular intensity distributions from various, 9: 4310(J)
precise positioning of, for calibration of detectors, 9: 1602
preparation, remote-control equipment for, 9: 572(J)
preparation of, and experimental studies, conference, 9: 3807(J)
preparation of, from radioactive Co, La, and Ce–Pr absorbed on clay, 9: 658
radiation dosages from MTR γ irradiation facility, 9: 2050
for radiotherapy, using Co^{60}, design, 9: 497(J)
rotating telecobalt, dose distribution and protection requirements, 9: 1726(J)
for treatment of cervical carcinoma, dosimetry, 9: 4052(J)

Gamma spectra
calculations, tables, and graphs, 9: 2472
from inelastic neutron scattering in Fe, 9: 419(J)

Gamma spectrometers
calorimetric, for absolute measurements during β decay, 9: 1972(J)
count-rate meters and pulse analyzers, design, 9: 696
description of, 9: 1970(J)
energy resolution of multiple-crystal, 9: 1067(R)
fluctuations in pulse energies, calculations on, 9: 1963
high-luminosity sector-type, design, 9: 1969(J)
lead glass plate, efficiency of, calculations on, 9: 1962
line shape of monochromatic γ radiation in scintillation, 9: 435(J)
pair, design of high-energy, 9: 338(J)
performance, 9: 1133
performance of, for determination of total fission products, 9: 3264(J)
performance of, in radiochemical analysis, 9: 874(J)
scintillating crystals for, performance, 9: 1597

Gamma spectroscopy
analytical uses of, in radiochemical analysis, 9: 874(J)

Gardner Area (Fla.)
geophysical exploration, map of, 9: 1832(J)

Gas analyzers
design and performance of dual ionization gage for, 9: 2820(R)
isotopic, applied to determination of isotopes of C and H, 9: 2180(J)

Gas flow
(See also Compressible flow; Convection; Incompressible flow; Liquid flow; Stack disposal; Subsonic flow; Supersonic flow; Transonic flow.)
boundary layer control by porous suction, theory, 9: 2695
coefficient of resistance in, at near sonic velocities, 9: 2233(J)
control, for aerosol sampling unit, equipment design, 9: 3721
heat transfer, effects of recirculating or vortex-like motion on, 9: 3812
measurement, design and calibration of a microflowmeter for, 9: 2655
measurement of velocity of, with hot-wire anemometers, 9: 3130(J)
selection of graphs for use in calculations of compressible air flow, 9: 3139(J)

Gas flow (laminar)
boundary layer in, mathematical analyses, 9: 3450
in capillaries of noncircular cross section, measurement, 9: 4127

Gas flow (turbulent)

aerosol coagulation and settling in, theory, 9: 2359(J)

boundary layers in adverse pressure gradients, momentum distribution, 9: 2693

influence of compression shock and boundary layers in, 9: 1014(J)

measurements in boundary layers, methods, 9: 2693

momentum terms in pipe flow, experimental evaluation, 9: 2694

Gas Hills Area (Wyo.)

stratigraphy, exploration, U distribution, and geology, 9: 1261(J)

Gas mask canisters

(See also Filters.)

containing silica gel, or activated carbon, efficiency for protection against diborane, pentaborane, and decaborane, 9: 53

Gas–metal systems

bibliography, 9: 963

Gaseous diffusion plants

control and development laboratory facilities, 9: 898

Gaseous ions

energy loss in gases of positive single scattered, 9: 1377(J)

ionic species formed in gases by collision with, 9: 1378(J)

ionization and overcharging of 5 to 30 kev, in gases, 9: 2383(J)

oscillations in halogen-quenched G-M counters, mechanism and effects of A additions on, 9: 309(J)

Gases

adsorption of, on the surface of a solid, quantum theory, 9: 3433(J)

analysis of mixtures by sonic method, 9: 4085(J)

application of intense corpuscular electron beams for excitation of, design and performance of apparatus for, 9: 2477(J)

charge states of heavy-ion beams passing through, 9: 992(J)

cooling by emission of radiation, theoretical analysis, 9: 2381

complex molecules of, effects of equilibrium pressure and vaporization rate measurements, 9: 2823(J)

density measurement with particle beam probes, 9: 1940(J)

design and performance of apparatus for continuous detection and measurement of low concentrations of O_2 in, by dew-point methods, 9: 2636(J)

design and performance of semiautomatic separation equipment for, 9: 2211(J)

detection of hydrogen in, 9: 4075

determination of, in metals by a vacuum fusion method, apparatus for, 9: 3406(J)

dielectric properties, 9: 1368

diffusion through base coat glasses, 9: 616

dissociation energies of, 9: 2437

dual ionization gage for, design and performance, 9: 2820(R)

dynamic pressure stage elements for projection of intense monokinetic corpuscular beams into, at high pressure, design and performance of equipment, 9: 2475(J)

electric breakdown in, departure from Paschen's Law, 9: 2376(J)

electrochemical determination of traces of O, 9: 2631

energy transfer between, theory, 9: 3571(J)

gas chromatographic separation and analysis of, 9: 2672(J)

high-frequency discharge in low-pressure, 9: 3567(J)

imperfect, characteristics, 9: 3911(J)

ionization and overcharging of 5 to 30 kev gaseous ions in, 9: 2383(J)

ionization of, by α and β particles, 9: 2539(R), 3899(J)

ionized, behavior in a magnetic field, 9: 1941(J)

kinetic equation for excitations of weakly interacting nonideal, 9: 3572(J)

mass spectrographic analysis of noncorrosive, 9: 3583

mass spectrographic analysis of noncorrosive, measuring techniques, 9: 3584

Gases (cont'd)

microwave spectroscopy of, review of recent advances, 9: 3347(J)

mixing of accurately blended samples of, equipment, 9: 3570

nonmaxwellian theory of homogeneous and anisotropic, 9: 1016(J)

prevention of mists in condensed, 9: 855(J)

radiometric analysis of, techniques and equipment, 9: 300

separation by diffusion through membranes, 9: 685(J)

solidified, compressibilities at low temperature, 9: 2824(J)

solubility of, in liquids, instrument for, 9: 3068

temperature measurements on, probe design, 9: 3578

theoretical and experimental study of perfect gas and equation of state of real gases, 9: 1576(J)

thermal conductometric analysis of, for water vapor, instrument for, 9: 99

thermal relaxation in, solution of linearized equations for sound dispersion in, 9: 3240(J)

ultraviolet emission in N_2, O_2, and H_2 by α bombardment, 9: 3241(J)

Gasket materials

stress relaxation of, testing, 9: 3140

Gastrointestinal tract

absorption of Pu by, effect of concentration of Pu in diet on, 9: 501

plutonium absorption from, comparison between rats and pigs, 9: 1703

Geiger-Mueller tubes

bromine-quenched and iodine-quenched, design, 9: 3259(J)

corona threshold and range of velocities of pulse spread in, 9: 2423(J)

for counting liquid samples, stability of calibration, 9: 2869(J)

dead time in, distribution, 9: 717(J)

design and performance, 9: 1041

design for β-active liquids, 9: 2856(J)

discharge in, with ethyl and iso-amyl alcohols, cloud chamber study of, 9: 1332(J)

effect of the semi-proportional region on counter threshold, 9: 1973(J)

efficiency of mica-window, as function of electrode geometry, 9: 1608

electrical characteristics, changes in, 9: 2863(J)

halogen-quenched, mechanism for production of oscillation in, 9: 309(J)

ionic multiplication coefficient of, filled with pure CO_2 or CO_2-alcohol mixture, 9: 719(J)

performance of, with external cathode, 9: 317(J)

radial sensitivity of Cl-quenched, using point millicurie sources, 9: 201

restitution time, measurement, 9: 3597(J)

testing equipment for electric properties, 9: 2850

time-lag in, 9: 2849

General Electric Research Lab.

progress reports on deformation and fracture of metals, 9: 3865(R)

progress reports on development of Zr-base alloys, 9: 190(R), 3180(R)

progress reports on research in physical metallurgy, 9: 188(R), 1864(R), 3867(R)

General Engineering Lab., General Electric Co.

progress reports on nondestructive inspection of adhesive bonded metal sheet, 9: 167(R), 1263(R)

General Mills, Inc.

progress reports on fine grinding project, 9: 3720(R)

Geochemical prospecting

application of paper-chromatographic methods of analysis to, 9: 3404(J)

paper chromatographic determination of trace metals in ores, 9: 2264(J)

Geochemistry

book, 9: 2715(J)

Geology

nuclear, book on, 9: 2715(J)

Geology (cont'd)
radioactive phenomena, survey, 9: 2710(J)
radioactivity as an aid in study of, 9: 2265(J)
theoretical effects of diffusion on isotopic abundance ratios in rocks and associated fluids, 9: 3464(J)
tracer techniques applied to age determinations in, contribution of bound β decay, 9: 953(J)
Geophysical prospecting
car-mounted equipment for, 9: 1521(J)
effects of drill-hole diameter on γ-ray intensity in, 9: 2714(J)
geological studies of U–V sandstone deposits by, 9: 2266(J)
by nuclear methods, book, 9: 2715(J)
theory of, with electromagnetic fields, 9: 1258(J)
Geophysics
age and origin of earth and natural radioactivity, book, 9: 2715(J)
radioactive phenomena, survey, 9: 2710(J)
Georgia (Charlton Co.)
map of geophysical exploration of Folkston area in, 9: 1631(J)
Georgia Inst. of Tech. State Engineering Experiment Station
progress reports on surface properties of fine particles, 9: 56(R), 3904(R)
Germanium
bremsstrahlung reactions at 320 Mev, interpretation of results, 9: 3654(J)
bremsstrahlung reactions at 320 Mev, nuclide yields from, 9: 3653(J)
electric breakdown due to ionization of impurity atoms, 9: 4210(R)
lattice constants, 9: 3408
metabolism of, as a substitute for B, by plants, 9: 3(R)
nuclear isomers, 9: 1067(R)
proton stopping cross section, 9: 2026
radiochemical determination, 9: 876
spectrographic determination of, in ores and rocks, 9: 162
Germanium–antimony alloys
phase studies, 9: 3184(J)
Germanium–bismuth alloys
phase studies, 9: 3184(J)
Germanium crystals
effects of neutron irradiation on electric conductivity, 9: 1042
Germanium–iron alloys
phase studies, 9: 3184(J)
Germanium isotopes Ge^{71}
orbital electron L to K capture ratio, 9: 2070(J)
Germanium isotopes Ge^{73}
Coulomb excitation functions and energy levels for, bombarded with 3.5-Mev α particles, 9: 423(J)
Germanium isotopes Ge^{75}
decay of the 49-sec isomer of, 9: 1673(J)
Germanium isotopes Ge^{77}
decay of ground state and 52-sec isomer of, 9: 1673(J)
decay schemes, 9: 988(R)
Germanium–nickel alloys
phase studies, 9: 3184(J)
Germanium oxides
heat and free energy of formation, 9: 529(J)
Glass
(See also Borosilicate glass; Cobalt glass; Optical systems; Phosphate glass; Sodium silicate glass.)
bonding to Al, method and testing, 9: 4123
coatings, permeability of base coat, to He, 9: 615
Glass (cont'd)
effects of radiation on, 9: 1118
effects of radiation on coloration of, control by various elements, 9: 2051
effects of radiation on surface properties of, 9: 2052(J)
fabrics, adhesion to silicone rubber, 9: 4114(R)
porous vycor, pore size and pore size distribution in, calculation from adsorption isotherms, 9: 2216(J)
radiation-sensitive, preparation and properties, 9: 2945(R)
scattering of molecules from surface of, 9: 650
soda-lime-silica, thermal conductivity, 9: 2793(R)
structure, effects of intense neutron irradiation on, 9: 4010
Glass foils
preparation and properties of thin, 9: 649
Glass wool filters
design and efficiency of, for hot-lab air, 9: 560(J)
for hot exhaust air from hoods and gloved boxes, performance, 9: 549
Glorieta District (N. Mex.)
mineralogy and exploration of, 9: 955(J)
Glove boxes
(See Dry boxes.)
Glucose
linkage of, in coliphage nucleic acid, 9: 870(J)
biosynthesis of C^{14}-labeled, 9: 2105(J)
metabolism of, in Co^{60}-irradiated mice, 9: 61(R)
synthesis of, by reduction of aldonic lactones, 9: 3117
synthesis of C^{14} labeled, by reduction of aldonic lactones, 9: 3117
Glutathione
luminescence of, under high-energy γ irradiation before and after 50 kv x irradiation, 9: 1783
metabolism of radioactive, in x irradiated and nonirradiated mice, 9: 15
protective effects of, against radiation effects on catalase, 9: 2199(J)
Glycerides
metabolism, 9: 2099(R)
Glycine
metabolism of, by E. coli, tracer study, 9: 2547(R)
metabolism of, in Co^{60}-irradiated mice, 9: 61(R)
radiation chemistry, 9: 2551(R)
Gold
adsorption of $AgNO_3$, Ag_2SO_4, and KCl on, 9: 3766
bremsstrahlung differential cross sections produced in, by 1-Mev electrons, 9: 427(J)
charge equilibrium ratios for H ions from proton bombarded, 9: 2486(J)
compressibility parameters and Grüneisen's constants, 9: 1863
cross sections for neutron transmission and multiplication, 9: 3646(J)
effects of 12-Mev deuterons on, near 10°K, 9: 2946(J)
elastic scattering of 22-Mev α particles from, 9: 2937(J)
electric properties of, for nuclear batteries, 9: 266
electrical resistance of cold-worked, recovery, 9: 3861
electron emission from, bombarded by hydrogen ions, 9: 250(J)
emission of secondary electrons (δ rays) by 1.3-Mev electron bombardment, 9: 1306(J)
heat of solution, in liquid Sn, 9: 4178
lattice defects and electrical resistivity, 9: 2330
neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)
neutron total cross section, 9: 297
proton differential cross section, 9: 2890(R)
proton reactions (p,n), angular distributions and yields at 23 Mev, 9: 4290(J)

Gold (cont'd)
proton stopping cross section, 9: 2026
radiochemical determination, 9: 876
range-velocity relation for fission fragments, 9: 1365(J)
scattering of 0.6-, 1.0-, and 1.7-Mev electrons from, 9: 2485(J)
slow neutron cross sections, 9: 1391(J)
three-quantum annihilation of positrons in, 9: 249(J)
Gold Butte District (Nev.)
thorium distribution, 9: 1260(J)
Gold–cadmium alloys
cubic to orthorhombic diffusionless phase changes in, 9: 3885(J)
diffusionless phase transformation, crystal structure, electric conductivity, thermal expansion, ferro-elastic behavior, effects of shear, bending, compression and tensile stresses, and heat treatment, 9: 1861(R)
Gold–copper alloys
electrolytic polishing, etching, and grain structure, 9: 2765(J)
Gold–copper alloys (liquid)
thermodynamic properties, 9: 188(R)
Gold–copper compounds (intermetallic)
energy relations in, colorimetric investigation of, 9: 2764(J)
ordered, electron diffraction study of, 9: 205(J)
Gold fluorides
preparation and heat of formation, 9: 2158(J)
Gold foils
neutron flux depression, 9: 3291(J)
Gold isotopes Au^{193}
existence of a 3.8-sec isomer of Au^{193m}, 9: 4017(J)
Gold isotopes Au^{195}
electron capture decay of, to Pt^{195}, 9: 387(J)
energy levels, 9: 1409(J)
Gold isotopes Au^{197}
proton excitation of, γ radiation and energy levels from, 9: 781(J)
Gold isotopes Au^{198}
capture cross section determined by spectrochemical analysis, 9: 2524(J)
colloidal, in treatment of effusions associated with carcinomas, 9: 1175(J)
colloidal, therapeutic uses in therapy of serous effusions arising from cancer, 9: 3041(J)
colloidal, with and without Ag-coating, localization following injection in brain, 9: 1172(J)
colloids of, carcinogenicity, 9: 18
colloids of, optimum sites of injection and lymph node concentration of, 9: 1457(J)
colloids of, preparation and tissue distribution in animals, 9: 1459(J)
colloids, tissue distribution and toxicology of, in rats and dogs, 9: 3041(J)
gamma spectra of, 9: 435(J)
half life, 9: 2960(J)
infusion of colloidal, equipment, 9: 2604(J)
particles, implants of, use in therapy of brain tumors, 9: 2127(J)
therapeutic uses of, for carcinoma of ovaries, pleura, and peritoneum, 9: 1162(J)
Gold–nickel alloys
enthalpy change and strain energy in formation of solid solutions of, 9: 187
entropy, 9: 188(R)
entropy of solution for, measurements, 9: 1864(R)
Gold oxides
heat and free energy of formation, 9: 529(J)
Gold–silver alloys
stored energy in, by drilling, filing, torsion, wire-drawing, and rolling at room temperature and 78°K, 9: 3177(R)
Gold–silver alloys (liquid)
Gibbs free energy and enthalpy of solution, 9: 3867(R)
thermodynamic properties, 9: 188(R)
Gold–silver couples
surface diffusion coefficients of, methods for determination, 9: 3848(R)
Gold–uranium alloys
phase studies of, by thermal, metallographic, and x-ray methods, 9: 1147(J)
Golovin Bay Area (Alaska)
mineralogy and U distribution in, 9: 1523(J)
Gonads
effects of x radiation on, in mice, 9: 2554(J), 2557(J)
uptake of yttrium chlorides following intraprostatic injection in dogs, tracer study, 9: 3378(J)
Goniometers
modification of commercial x-ray, for neutron diffraction measurements, 9: 2413
Goodsprings Mining District (Nev.)
uranium distribution and geology, 9: 1260(J)
Goodyear Atomic Corp.
control and development laboratory facilities, 9: 898
Goulder Goulch Claim (Calif.)
geology, 9: 3837(J)
Goose Creek District (Idaho)
radioactive carbonaceous shale and lignite deposits, 9: 2263
Grain-boundary diffusion
in aluminum–copper couples, 9: 971(R)
anisotropy of, 9: 1285(J)
Grain growth
effects of particle size on, of sintered Ag powder, 9: 2318(J)
exaggerated, during extrusion, 9: 1545(J)
Granite Mountain Area (Alaska)
mineralogy and U distribution in, 9: 1523(J)
Granites
alpha radioactivity in, 9: 445(J)
Grant View Hot Spring (Nev.)
exploration, 9: 1260(J), 1516(J)
Grants District (N. Mex.)
mineralogy, 9: 1829
Graphite
(See also Carbon.)
adsorption of hydrocarbons from methanol and ethanol solutions by nonporous, 9: 1790
approximate method of evaluating lattice sums of r^{-n} for, 9: 3086(J)
cosmic shower production in, 9: 2814(J)
crystal structure, rhombohedral modification of, 9: 2654(J)
crystal structure of artificial, layer growth of, 9: 2653(J)
electric conductivity and magnetic susceptibility, 9: 1558(J)
electrical properties, effects of neutron irradiation on, 9: 3328(J)
electronic structure, theory, 9: 1626(J)
formation of spheroidal, 9: 206(J)
heat-transfer film coefficient of flowing liquid Sn to, 9: 139
lattice vibration specific heat, theory, 9: 3087(J)
low-temperature specific heat, 9: 188(R)
low-temperature thermal and electrical conductivity and thermoelectric power of, 9: 1476

Graphite (cont'd)
lubricity for high-temperature ball bearings, 9: 1813
mass spectrometric C_3^+ measurements in vapor of, relation to electron-induced water decomposition, 9: 105(J)
neutron capture cross section, relative accuracy of Swing measurement, 9: 2473
nucleation and growth of, in steel, 9: 96(J)
oxidation of natural, at 900°C and moisture, volatile matter, and ash determination in, 9: 3088(J)
physical and chemical properties and use in the construction of chemical apparatus, 9: 3421(J)
preparation and use, summary, 9: 4093(J)
resonance energy, 9: 1777(J)
sources, bonding, fabrication, and metallurgical uses, 9: 2303(J)
specific heat of high-purity Acheson, down to 1.3°K, 9: 3867(R)
states of, electronic density, theory, 9: 3788(J)
structure of the π band of, 9: 2192(J)
theory of Hall effect in, 9: 2193(J)
thermal conductivity, temperature dependence of, 9: 2330
thermodynamic functions of, to 12,000°K, 9: 1896
valence bonds of two-dimensional, 9: 2191(J)
Graphite compounds
paramagnetic resonance absorption in, 9: 1778(J)
Graphite crucibles
preparation and properties of Ti, Zr, V, Nb, Ta, and W, for molten Tl, 9: 2247
Graphite crystals
electric conductivity measurement of single, 9: 728(J)
Graphite moderated reactors
West German plans for, 9: 2911(J)
Greases
(See also Lubricants.)
development and evaluation of, for −100° to +350°F, 9: 2690(R)
performance in lubricating open, shielded, and anti-friction bearings, 9: 2790(R), 2791(R)
silicone, lubricity and performance at high temperature, 9: 1814(R)
Great Divide Basin (Wyo.)
stratigraphy and U distribution in, 9: 2263
Green Monster Mine (Nev.)
geology and uranium distribution, 9: 1260(J)
Green Vein Mesa (Utah)
mineralogy, 9: 1829
Grinding
effects of chemical agents and studies in a vibratory ball mill, 9: 3111(R)
equipment for, of rock samples using alumina ceramic, 9: 3471(J)
Growth
effects of radiation on, of bulbs, 9: 36(J)
effects of x radiation on, of barley, as a test for physiological effects of radiation, 9: 1159(J)
Ground
atmospheric β ionization from, 9: 3153
gamma scattering by, Monte Carlo calculation, 9: 1375
Ground waters
alpha radioactivity in, 9: 445(J)
capillary conduction, 9: 236(J)
concentration of radium and thorium in wells of the Chicago and Frankfurt am Main, Germany, areas, 9: 3231(J)
diffusion through soil, tracer study, 9: 2539(R)
Guinea pigs
effects of x radiation at doses between 1,000 and 25,000 r on, 9: 1168(J)
Guinea pigs (cont'd)
lethal dosage determination of radiation for, 9: 1720
lethal effects of radiation, 9: 2567(J)
metabolism of Te^{132}–I^{132} mixtures in, 9: 3754(J)
spontaneous tumors in, a literature survey, 9: 2545(J)
Gypsum Gap Quadrangle (Colo.)
preliminary geologic map of, 9: 3470(J)
Gypsum products
dissolution of, in water and in acids, effects of turbulent flow and temperature, 9: 3448(J)
Gyromagnetic ratio
measurement of C^{13}, by collapse of spin-spin splitting in $C^{13}H_3I$, 9: 361(J)

H

Hack's Canyon Mine (Ariz.)
mineralogy, 9: 1829
Hafnium
content and ratio to Zr in minerals and rocks, 9: 1522(J)
dissolution of, in acids, 9: 2783(J)
friction testing of halogenated hydrocarbon lubricated, 9: 961(R)
hyperfine structure of Hf I, isotope shift in, 9: 1138(J)
spectroscopic determination, 9: 4084(J)
spectroscopic determination in Zr, 9: 3074(J)
x-ray spectrographic determination in Zr minerals and concentrates, 9: 3073(J)
Hafnium chlorides
addition compounds with diethyl phthalate, preparation and properties, 9: 72(J)
Hafnium isotopes
electromagnetic concentration of, 9: 2837
Hafnium isotopes Hf^{177}
energy levels from β decay of Lu^{177}, 9: 2058(J)
gamma spectra, 9: 4333
Hafnium oxides
heat and free energy of formation, 9: 529(J)
high-purity, preparation, 9: 868(J)
Hair
fibers of, interaction with aqueous solutions including dye baths, tracer study, 9: 922(J)
Halides
(See also specific halides and halides of specific elements; see also Alkaline earth halides; Alkyl halides.)
detection, film sensitive to halide ions in water aerosols for, 9: 1001(J)
pyrohydrolytic determination of, design of apparatus for, 9: 3411(J)
Halogen fluorides
molecular electric dipole moments, 9: 547
Halogen oxides
heat and free energy of formation, 9: 529(J)
Halohydrocarbons
radiation decomposition of, 9: 102
Hamm Canyon Quadrangle (Colo.)
mineral investigations field studies map of, 9: 4150(J)
Hamsters
lethal dosage determination of radiation for, 9: 1720
Handbooks and manuals
(See also as subheading under specific processes, equipment or sites.)
marine waste disposal, 9: 604(J)
on permissible dose from external sources of ionizing radiations, 9: 1453(J)

Handbooks and manuals (cont'd)

on photographic dosimetry of x and γ radiation, 9: 2428(J)

on protection against radiations from radium, Co^{60}, and Ca^{137}, 9: 1452(J)

on radiation monitoring, 9: 3928

on radiology, 9: 2542(J)

on rare metals, 9: 2245(J)

Hastelloy

(See Nickel alloys.)

Haynes 25 Alloy

(See Chromium–cobalt–nickel–tungsten alloys.)

Health physics

anthology of data, 9: 3746

Heart

arrhythmias of, induced by intra-cerebral injection of tryptamine-strophanthidin, effect of chlorpromazine on, in dogs, 9: 3005

effects of lipoprotein metabolism and thermal injury on function, 9: 3730(R)

Heat exchangers

aluminum alloy, application of, in process industries, resistance to corrosion, 9: 950(J)

calculation of finside coefficients in longitudinal finned-tube, equations for, 9: 3138(J)

design and construction of a Na-steam superheater test plant, 9: 3443

design and construction of liquid-metal, 9: 3443

design and performance for Hg heat-transfer studies, 9: 1807(R)

design and performance of, for liquid Na, 9: 1806

design of 100-Kw NaK–Na heat transfer unit, 9: 4179(R)

fabrication of, welding procedures, 9: 632

of graphite, design and performance, 9: 3421(J)

heat and momentum transfer in spined tubes in, 9: 141(J)

heat transfer and effect of voids and Prandtl modulus in tube banks and beds, 9: 2692

heat transfer in cross-flow, equations for penetration of heat or solutes, 9: 140(J)

NaK cross-flow, testing, 9: 4175(R)

testing of welds in experimental 14-in., 9: 939

welding of tubular, 9: 216(J)

Heat exchangers (liquid-liquid)

testing of stainless steel and Zr tubes in liquid NaK and Na loops, 9: 1254

Heat of absorption

of nitrogen on finely divided solids, measurement of, 9: 1789(R)

Heat of combustion

vacuum jacket precision calorimeter for measurement of, design and performance, 9: 278(J)

Heat of formation

tables of bond and resonance energies for estimating, 9: 2785

Heat of fusion

and temperature of fusion ratio, relation to atomic number, 9: 3552(J)

Heat of sublimation

of elemental species at 298°K, 9: 2137

Heat-resisting alloys

(See also specific alloys concerned.)

analysis of, using anion-exchange separations, 9: 1544

with bases of Co alloys and austenitic steel, preparation and properties, 9: 3488(R)

casting and forging for gas turbine application, 9: 3869

composition, preparation, properties, and testing of ceramic coatings for, in nuclear reactors, 9: 2249(J)

compression-creep properties, 9: 3504(R)

Heat-resisting alloys (cont'd)

compressive-stress-rupture properties of, 9: 3503(R)

creep, rupture, and thermal shock tests on castable turbine blades, low in Co and Nb, 9: 1890(J)

effects of B, Ti, W, and Zr additions on mechanical properties of stainless steel, 9: 3502(R)

effects of heat treatment on elevated-temperature tensile properties and microstructure of Ti-base, 9: 2719(R)

hot ductility, device for testing and results, 9: 4197(J)

powder-metallurgy of, review, 9: 198(J)

powder metallurgy of X-40, 9: 3173

powder preparation, microstructure, and x-ray-diffraction patterns of Cr_2Ti, $CoTi_2$, and $NiTi_2$, 9: 3841(R)

rupture and tensile properties of wrought and cast Fe- and Co- base, 9: 2720(R)

static, fatigue, and mechanical properties of wrought N-155 alloy at elevated temperatures, 9: 4170

tensile properties, creep-rupture at 1350 and 1500°F, and microstructure, 9: 3859

x-ray density and oxidation of Cr–Ti alloy, 9: 3841(R)

Heat transfer

(See also Boiling; convection; Heat exchangers; Thermal conductivity; Thermal radiation.)

analogy between mass transfer and, in turbulent flow, 9: 4132

boiling burnout measurements, 9: 4131

to boiling liquid by free convection from heating surface, 9: 1810(J)

in boiling liquids, 9: 1811(J)

boiling, mechanism, 9: 4129

at boiling of various one-component liquids at free convection, 9: 1809(J)

to boiling water forced through a uniformily heated tube, 9: 1804

calculation of finside coefficients of, on longitudinal finned-tube exchangers, equations for, 9: 3138(J)

from circular finned cylinders by free convection, 9: 1808

coefficient of inclined falling liquid film, effects of angle of inclination and mass flow rate on design data, 9: 3133(J)

in cross-flow heat exchangers and packed beds, equation for penetration of heat or solutes in, 9: 140(J)

design and performance of apparatus for measuring condensing film, 9: 3132(J)

effect of circulation on, 9: 3812

effect of voids and Prandtl modulus in tube banks and beds, 9: 2692

effects of agitation on rate of, between air and surfaces in contact with fluidized beds, 9: 2235(J)

electric analogs for solving equations in, 9: 3451(J)

electrical-geometrical analogs for two-directional problems, 9: 2691

in evaporation of spherical drops of liquid falling through a current of gas, 9: 1015(J)

film coefficient of, for non-Newtonian water suspensions in turbulent flow containing solids of high thermal conductivity, 9: 2236(J)

general law for turbulent flow in pipes, 9: 3447(J)

graphite-liquid Sn system for, at very high temperatures, 9: 139

of liquid metals, review of experimental investigations, 9: 3125

local, by plates in subsonic air flow, 9: 1493(J)

mathematical analysis of, in combined free and forced convection laminar flow of fluids with and without heat sources in channels with linearly varying wall temperatures, 9: 2229

maximum and minimum values of heat transmitted from metal surfaces to boiling water under atmospheric pressure, 9: 3129(J)

performance curves, 9: 2697(J)

pressure effects on coefficients of, in boilers, 9: 1242(J)

rates between hot Hg drops and water, spray column measurement, 9: 2099(R)

review, 9: 3137(J)

Heat transfer (cont'd)
in SIR, testing of components for, 9: 4175(R)
solutions for complex geometry by electric analogue techniques, 9: 2232(J)
in spined tubes in heat exchangers, 9: 141(J)
in starting area of air-passed slots, 9: 2230(J)
symposium on, 9: 940(J)
by thermal convection in a long cell containing a heat-generating fluid, 9: 4128
in turbulent flow at smooth walls, mathematical analysis, 9: 3126
in vertical tube closed at bottom, measurement, 9: 1805
Heaters
design of heating transformer, 9: 931
electric, for carbon combustion apparatus, 9: 1211
Heavy water reactors
conversion ratios and multiplication factors in, 9: 1081(J)
thermal utilization factor in, nomographic determination of, 9: 1086(J)
transfer function of, effect of photoneutrons on, 9: 1084(J)
Helium
analytical one-electron wave functions in multi-configurational approximation for, 9: 2086(J)
continuous detection and measurement of low concentrations of O_2 by dew-point method, 9: 2636(J)
diffusion through base coat glass coatings, 9: 615
diffusion through base coat glasses, 9: 616
elastic scattering of protons and deuterons by, 9: 410(J)
electron capture from, by fast protons, 9: 1287(J)
electron detachment from H ions by impact with, 9: 3556(J)
electron scattering, 9: 3696
energy loss of positive ions single scattered in, 9: 1377(J)
excitation of, in fast encounters with H atoms, protons, and positive He ions, 9: 1380(J)
excitation of 2^1S and 2^3S states by electron impact, calculation, 9: 2478(J)
inelastic scattering of electrons by, 9: 3994
ionization by α particles and fission fragments, 9: 2821
photodisintegration, 9: 1363(J)
pion production cross sections in n-α collisions, 9: 3954
polarization of high-energy protons in elastic scattering on, 9: 789(J)
proton elastic scattering at 9.76 Mev, 9: 4301(J)
Schrödinger equation for, a more accurate solution of, 9: 1419(J)
second virial coefficients from the exp-six potential, 9: 1908(J)
solubility in liquid N between 78 and 109°K and up to 395 atm., 9: 240(J)
specific ionization of, by high-energy electrons, 9: 3315(J)
thermal conductivity and viscosity of, from 0 to 600°C, 9: 2822
Helium (liquid)
gamma transition of, 9: 667(J)
specific heat and heat capacity, 9: 3220(J)
supercritical damping of oscillating disks in, 9: 3219(J)
theory, 9: 997(J)
thermomechanical effects in, at 1°K, 9: 665(J)
viscosity, 9: 652(R)
Helium–ammonia systems
mutual solubility of gases at high temperatures in, 9: 3239(J)
Helium–carbon dioxide systems
mutual solubility of gases at high temperatures in, 9: 3239(J)
Helium films
composition of He^3–He^4 mixtures adsorbed on Fe_2O_3, 9: 3897(J)
Helium ion beams (He^3)
bombardment of C targets by high-energy, production of neutrons in, 9: 1993(J)
range-energy and energy-momentum relations, tables, 9: 402
reactions with deuterium in energy range 100 to 800 kev, 9: 2451(J)
Helium ions
charge transfer cross sections for, in rare gases and H_2, 9: 2806(J)
electron capture from H atoms by, 9: 1287(J)
inelastic collisions with He atoms, 9: 1380(J)
Lamb shift, 9: 731(R)
Helium isotopes
compressibility factors of, computation of isotope effect on, 9: 3893
Helium isotopes (liquid)
surface tension of mixtures of, as function of temperature and He^3 concentration, 9: 660(J)
Helium isotopes He^3
deuteron reactions (d, γ), 9: 1090(J)
elastic scattering of protons by, angular distribution, 9: 4005(J)
hyperfine structure of He^{3+} and He^3, 9: 4279(J)
nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)
nuclear susceptibility of liquid and solid, 9: 2350(J)
orthoboric densities of, from 1.3 to 3.2°K, 9: 666(J)
production in high-energy d-d collisions, comparison to H^3 production, 9: 1659(J)
vapor pressure of solutions of, with He^4, 9: 243(J)
Helium isotopes He^3 (liquid)
adsorption of mixtures of liquid He^4 and, on Fe_2O_3, 9: 3897(J)
concentration of He^3 in He^3-He^4 mixtures by superfluid filtration, 9: 663(J)
energy levels, 9: 3281(J)
heat and entropy of mixing with He^4 on basis of two-fluid theory of He^4, 9: 1561(J)
interpretation of magnetic behavior of, 9: 2351(J)
specific heat and heat capacity, 9: 3220(J)
surface tension from 1.08 to 2.32°K, 9: 2342(J)
theoretical treatment of, based on the cell model, 9: 2803(J)
theory, 9: 1560(J)
thermal excitations of, influence of symmetry effects on, 9: 3900(J)
thermodynamic properties of solutions with He^4, 9: 2801(J)
vapor pressure, 9: 1906(J)
Helium isotopes He^4
binding energy, 9: 4273(J)
elastic scattering of 9.7-Mev protons, 9: 1388(J)
photodisintegration, 9: 1363(J)
pressure-volume isotherms below 4.2°K, 9: 1907(J)
proton reactions (p,d), (p,2p), and (p,pn), 9: 377
scattering of 14.3-Mev neutrons by, 9: 2941(J)
vapor pressure of solutions of, with He^3, 9: 243(J)
Helium isotopes He^4 (liquid)
adsorption of mixtures of liquid He^3 and, adsorbed on Fe_2O_3, 9: 3897(J)
heat and entropy of mixing with He^3 on basis of two-fluid theory of He^4, 9: 1561(J)
specific heat and heat capacity, 9: 3220(J)
thermal excitations of, influence of symmetry effects on, 9: 3900(J)
thermodynamic properties of solutions with He^3, 9: 2801(J)
vapor pressure, 9: 1906(J)
x-ray diffraction analysis, 9: 1288(J)
x-ray scattering and spatial distributions of atoms in, 9: 648
Helium isotopes He^6
beta spectrum, 9: 2099(R), 4039(R)
decay and half lives, 9: 1680(J)
energy levels, 9: 763(J)
Gamow-Teller interaction in decay of, 9: 3337(J)
half life, 9: 2951
mass difference of Li^6 and, 9: 763(J)

Hematites

adsorption of dodecylamine acetate and wettability, 9: 1486

Hematopoietic system

(See also Bone marrow.)

adenosine triphosphatase and 5-nucleotidase activity and metabolism of, effects of radiation on, in rats, 9: 480(R)

effects of implantation of exogenous tissues from, on radiosensitivity of rats, 9: 480(R)

effects of radiation on, in rats, 9: 2548(R)

effects of repetitive exposure to γ radiation on, in rats, 9: 482

enzyme systems of, effect of total-body x irradiation on, in rats and mice, 9: 14

radiosensitivity and response to colchicine of, in tadpoles, 9: 1448(J)

uptake of Fe by, and effects of radiation on, in young rats, tracer study, 9: 3050(J)

Hemoglobin

association of Po^{210} with, in blood metabolism, 9: 1708(J)

Henebergh Tunnel Area (Nev.)

exploration and U distribution, 9: 1260(J)

Henry Mountains Area (Utah)

exploration, 9: 3466(J)

Heparin

activation of enzyme systems by, in blood plasma, 9: 2540

storage of, by mast cells, effects of thrombokinase, 9: 1706(J)

Heptane

mixtures with perfluoroheptane and $TiCl_4$, total pressure from 25 to 80°C, 9: 1751(J)

wear of stainless steel bearings in, 9: 2280

Heptane, hexadecafluoro-

mixtures with heptane and 3-methyl heptane, total pressure from 25 to 80°C, 9: 1751(J)

Heptane, 3-methyl

mixtures with perfluoroheptane and tetrachloromethane, total pressure from 25 to 80°C, 9: 1751(J)

Heptyl alcohol

adsorption on Cu from aqueous solutions as inferred from H_2 overvoltage measurements, 9: 595(J)

Heterocyclic compounds

of boron, preparations and reactions of, with di-Grignard prepared from pentamethylene and tetramethylene bromides, 9: 597

Heterogeneous reactors

mathematical analysis by reduction to homogeneous reactor equations, 9: 758(J)

nonlinear kinetics of ZOE, 9: 3979(J)

for power, advantages of, 9: 1357(J)

thermal utilization factor, calculation by matrix formalism, 9: 3292(J)

thermal utilization factor in nomographic determination of, 9: 1086(J)

thermal utilization in infinite, effects of coolant or cladding in lattice, 9: 3981(J)

Heteropoly acids

molecular weight determination of silicotungstic acid, 9: 4072(J)

spectrophotometric determination of P as molybdovanadophosphoric acid, 9: 2635

Hexadecane

wear of stainless steel bearings in, 9: 2280

Hexanethiols

adsorption of by Ag, contact angle measurements, 9: 3111(R)

Hexogen

detonation velocities of, 9: 3214

High Climb Pegmatite (S. Dak.)

geology, mineralogy and petrology, 9: 3836(J)

High-temperature alloys

(See Heat-resisting alloys.)

High-temperature oxidation

of synthetic base oils, effects of antioxidants, 9: 4115(R)

Hippuric acid

biosynthesis of C^{14}-labeled, in rats, 9: 486(J)

Hiroshima

atomic bomb injuries among survivors, 9: 3366(J)

effects of atomic explosion on residents, summary, 9: 3745(J)

incidence of leukemia among atomic bomb survivors, 9: 2586(J)

residents of, medical effects of atomic bombs on, statistical analysis, 9: 2535

Holbrook Area (Ariz.)

mineralogy, 9: 1829

Holmium

tissue distribution of, in experimental animals, tracer study, 9: 1725(J)

tissue distribution of, in rats, tracer study, 9: 2551(R)

Holmium chlorides

crystal structure, 9: 544(J)

Holmium isotopes Ho^{166}

decay schemes and spectra, 9: 1405(J)

Homogeneous boiling reactors

design and cost estimates, 9: 751(J)

Homogeneous Reactor Experiment

kinetics, solution of problems with HRE simulator, 9: 371

Homogeneous Reactor Test

design, 9: 3294(J)

Homogeneous reactors

power from, cost factors in, 9: 1642(J)

recombination of H_2 and O_2 from, 9: 754(J)

Hope Creek Area (Alaska)

geology and prospecting, 9: 628(J)

Horizons, Inc.

progress reports on determination of coefficients of surface diffusion, 9: 3845(R)

progress reports on investigation of a new method for determination of coefficients of surface diffusion of metals, 9: 3848(R)

progress reports on research on cladding of base metals, 9: 3477(R)

Hormones

(See also specific hormones, e.g., Corticosterones.)

effects of, on radiosensitivity of somatic cells, 9: 821(J)

effects of, on resorption rate of injected $NaHCo_3$ in rats, tracer study, 9: 3732(J)

Horn Drilling Area (Utah)

geology, geophysical exploration, mineralogy and stratigraphy, 9: 1512

Hot Springs Dome Area (Alaska)

uranium distribution in, 9: 1523(J)

Howling Coyote Claim (Colo.)

uranium distribution, 9: 1513

Hunter Creek Area (Alaska)

uranium distribution in, 9: 1523(J)

Hunt's Mesa (Ariz.)

mineralogy, 9: 1829

Hurricane Operation

fission products from, uptake by plants and animals, 9: 35(J)

Hyaluronic acid
birefringence, 9: 2164
effects of radiation on, 9: 2659(J)
Hyaluronidases
effect of radiation on, 9: 2659(J)
Hyatt Pegmatite (Colo.)
geophysical exploration and geology, 9: 3157(J)
Hydra
irradiation injuries of, protective effects of Mg, 9: 41(J)
Hydraulic fluids
corrosive effects, oxidation, thermal decomposition, and properties, 9: 2795(R)
corrosive effects, properties, and thermal decomposition, 9: 3123(R)
high-temperature, development and properties, 9: 4120(R)
properties and corrosive effects, 9: 136(R)
Hydraulics
(See also Fluids; Pumps, Valves.)
numerical solution of transient hydrodynamic shock problems in 2 space dimensions, 9: 3811
vorticity and deformation in, 9: 1494(J)
Hydrides
(See also specific hydrides, e.g., Aluminum hydrides; see also Borohydrides.)
bibliographies on preparation of, 9: 635(R)
binary, dynamics, 9: 3555(J)
Hydriodic acid
atomic polarizations and dipole moments of, theory, 9: 2888(J)
pure rotational spectra of D-labeled and unlabeled anhydrous, in spectral region between 45 and 170μ, 9: 2217(J)
tritium labeled, microwave spectra, 9: 2097(J)
Hydrobromic acid
atomic polarizations and dipole moments of, theory, 9: 2888(J)
pure rotational spectra of D-labeled anhydrous, in spectral region between 45 and 170μ, 9: 2217(J)
tritium labeled, microwave spectra, 9: 2097(J)
tritium labeled, 1 to 2 mm wave spectra, measurements, 9: 4032(J)
Hydrobromic acid (labeled)
microwave spectra, 9: 731(R)
Hydrocarbons
(See also specific compounds and classes of compounds.)
adsorption of, from methanol and ethanol solutions by nonporous carbons, 9: 1790
gas chromatographic elution of gaseous and liquid, from alumina, silica gel or charcoal by CO_2, N_2, or H_2, 9: 2672(J)
isotopic exchange of D between HF and, 9: 3784
radiation decomposition of, 9: 102
thermal conductivity of viscous, 9: 2336(J)
Hydrochloric acid
activity coefficients of, in $SrCl_2$ solutions, 9: 4071(J)
atomic polarizations and dipole moments of, and D-labeled, theory, 9: 2888(J)
corrosive effects of, on Cu, kinetics, 9: 2251
corrosive effects on Al, effects of heat treatment, iron content, and acid composition, 9: 2706
intergranular corrosion of high-purity Al by, grain-boundary segregation of impurity atoms in, 9: 3826
tritium labeled, 1 to 2 mm wave spectra, measurements, 9: 4032(J)
Hydrocyanic acid
nuclear quadrupole interaction in, and D-labeled, in the bending vibrational mode, 9: 2985(J)
quadrupole coupling of deuterons in D-labieled, 9: 2647(J)
Hydrodynamics
(See also Hydraulics.)
Hydrofluoric acid
anhydrous, dissociation of fluoborate ion in, 9: 866(J)
boron trifluoride in, conductance and vapor pressure of, 9: 867(J)
infrared band of molecular complex between CF_2 and HF, 9: 896(J)
labeled with deuterium, isotopic exchange of D between hydrocarbons and, 9: 3784
liquid anhydrous, activity of solution components in, 9: 1768(J)
liquid anhydrous, cell for study of infrared spectra of, 9: 1135(J)
preparation of UF_4 and PuF_4 with anhydrous and aqueous, 9: 1210(J)
rate of solution of Hf-free Zr in solutions of, 9: 3144
specific gravity and volumetric determination of hydrofluoric acid in, 9: 1202(J)
volumetric determination of, in hydrofluoric acid–nitric acid mixtures, 9: 1202(J)
Hydrofluoric acid–sodium fluoborate systems
phase studies, 9: 2614
Hydrofluoric acid–sodium fluoride systems
phase studies, 9: 2614
Hydrogen
activated adsorption on pyrolytic nickelous oxide, 9: 65
analysis of ortho and para mixtures of, by thermal conductivity method, 9: 2439(J)
blistering and embrittlement of pressure vessel steels by, 9: 1887(J)
charge transfer cross sections of protons, H ions and He ions in, 9: 2806(J)
continuous ion exchange with an endless belt of phosphorylated cotton, 9: 3104(J)
depolarization in metal corrosion, 9: 4143(J)
detection in gases, 9: 4075
determination of, in Ti and Ti alloys, 9: 3077(J)
diffusion and vacuum extraction determinations in Ti, 9: 981(J)
diffusion in Fe, 9: 2297
diffusion in Fe and ferritic steels, 9: 3191(J)
diffusion in Pd, 9: 969
diffusion in Zr, 9: 244(J)
diffusion through Ni and design of leak for, 9: 1577
divalent, in FHF^- ion, 9: 2185(J)
effect of, on the mechanical properties of Ti, 9: 2749(J)
effect of, on the mechanical properties of Ti and Ti alloys, 9: 1857
effects on ductility of SAE 1020 steel, 9: 2285
effects on metals, 9: 1272(J)
elastic scattering of electrons by, perturbation calculation, 9: 1657(J)
elastic scattering of electrons by excited 2s and 2p states of, 9: 1381(J)
electrolytic separation of, from D, effect of nitrate ion and NH_3 on, 9: 1594(J)
electron capture from, by He ions, 9: 1287(J)
electron losses in H_2, He, N_2, O_2, Ne, and A, 9: 1067(R)
embrittlement of plated and unplated high-strength steel by, 9: 2297
embrittling effects in Ti and Ti alloys, 9: 3183
gamma reactions (γ,π), 9: 3966(R)
gas chromatographic elution of gases and volatile liquids from alumina, silica gel, or charcoal by, 9: 2672(J)

Hydrogen (cont'd)

hyperfine splitting in ground state of atomic, 9: 454(J)

hyperfine structure, 9: 731(R)

hyperfine structure in acids, 9: 1687(J)

hyperfine structure of, mass corrections to, 9: 3346(J)

inelastic collisions with He atoms, 9: 1380(J)

infrared emission spectra of molecular, between 1.15 and 1.97μ, 9: 2520(J)

interaction with clean metal surfaces, 9: 2159(J)

ion exchange on Dowex 50 at 25°C, 9: 3795(R)

isotope effects in alkaline cleavage of triorganosilanes, 9: 3057(J)

isotopic composition of, in carbonaceous meteorites, 9: 1834(J)

kinetics of reaction with nitric acid, 9: 3051

low pressure solubility in U, 9: 1797(J)

mass-spectrographic analysis of, for D, 9: 3920

π-meson total cross sections, 9: 1111(J)

π^0-meson photoproduction in H, differential cross sections from 180 to 215 Mev at 135°, 9: 4261(J)

π^0-meson photoproduction total cross sections from threshold to 240 Mev, 9: 4260(J)

neutron penetration in, 9: 1106

neutron total cross sections, 9: 1107

neutron total cross section measurements at high energies, 9: 4004(J)

ortho-para, continuous analysis of, 9: 3399(J)

photoproduction of neutral pions in, 9: 3609(J), 3610(J)

photoproduction of π^+ mesons from, near threshold, 9: 4258(J)

proton cross sections, 9: 2459

proton total cross sections, 9: 2458

proton total cross sections at 208 and 315 Mev, 9: 358(J)

quenching of resonance radiation of K by, 9: 248(J)

reaction of H atoms, with other H atoms, contribution of double transitions to cross sections associated with, 9: 2943(J)

recombination, from homogeneous reactors, 9: 754(J)

reduction of NiO with, kinetics of, 9: 2617(J)

reduction of silver chloride by, 9: 3765

reduction of silver chlorides by reaction mechanisms, 9: 3763, 3764

role of, in energy transfer in complex molecules, 9: 3275

scattering cross sections of H^- ions in, 9: 2471

scattering of Po α particles, 9: 1379(J)

solid, molecular properties, 9: 3617(J)

solidified, compressibilities at low temperature, 9: 2824(J)

solubility and decomposition pressures of, in α Zr, 9: 1877(J)

solubility of, in liquid methane at temperatures from 90.3 to 127.0°K and at pressures from 180 to 230 atm., 9: 241(J)

solubility of, in liquid N at 79 to 109°K and pressures to 190 atm., 9: 239(J)

solubility of, in Ti and Ti alloys, 9: 1857

solubility of, in water, enrichment of D_2 in, 9: 2405

specific heat, thermal conductivity, and viscosity of, from 0 to 600°C, 9: 2822

specific ionization of, by high-energy electrons, 9: 3315(J)

Stark effect broadening of high Balmer lines, 9: 450(J)

thermodynamic functions of, to 12,000°K, 9: 1896

ultraviolet emission by α bombardment, 9: 3241(J)

yield from decomposition of methanol by Co^{60} gamma radiation and 28-Mev He ions, 9: 2202(J)

Hydrogen (liquid)

flexible transfer tube, design, 9: 3089

production, maintenance manual for portable liquefaction plant for, 9: 4119

production, operation manual for portable liquefaction plant for, 9: 4118

Hydrogen (liquid) (cont'd)

styrofoam containers for targets of, having a liquid N heat shield, design, 9: 654

Hydrogen–deuterium systems

radiation-induced and catalytic-induced equilibrium constants, 9: 4090(J)

Hydrogen fluoride ions

(See Acid fluoride ions.)

Hydrogen ions

charge equilibrium ratios for, from protons incident on solids, 9: 2486(J)

charge transfer cross sections for, in rare gases and H_2, 9: 2806(J)

electron detachment from, by impact with He, 9: 3556(J)

electron emission from Mg, Al, Fe, Ni, Au, and Pb, bombarded by H_1^+ and H_2^+, 9: 250(J)

negative atomic, charge transfer to protons, 9: 3672(J)

negative, production and scattering in H, 9: 2471

sources, measurement of variables, 9: 2388(J)

Hydrogen isotopes

compressibility factors of, computation of isotope effect on, 9: 3892

electrolytic separation factor of, at Hg cathode, 9: 71(J)

electrolytic separation of, 9: 1435(P)

enrichment of H_2 in D_2 during H_2 dissolution in water, 9: 2405

gas phase measurement of β particles from, 9: 2180(J)

Hydrogen–methane systems

phase studies, 9: 241(J)

Hydrogen–nitrogen systems

phase studies, 9: 239(J)

Hydrogen–nitrogen–titanium systems

preparation and constitution diagrams, 9: 4187

Hydrogen peroxides

analytical procedures for, stabilization, and industrial uses, 9: 521

bibliographies, 9: 520, 521

catalytic decomposition in presence of O_2, 9: 2130

chemical properties and decomposition, bibliography on, 9: 3383

determination, 9: 2657(R)

formation of, by α irradiation of aqueous solutions, inhibitory effects of Cl^-, 9: 581(J)

formation of, from radioinduced decomposition of water, effects of KCl and KBr on, 9: 2660(J)

infrared absorption spectra of natural and D-labeled

kinetics of oxidation of selenious acid by, 9: 851

physical properties and structure, 9: 520

solid γ-irradiated, paramagnetic spectra, 9: 3423(J)

Hydrogen peroxides-d_2

solid γ-irradiated, paramagnetic spectra, 9: 3423(J)

Hydrogen–sodium systems

dissociation pressures of H in Na–NaH–H systems at 500° to 600°C, 9: 3774(J)

Hydrogen sulfide–water systems

effects of, on electrode potentials and corrosion of Zn, Fe, Al, Ag, Pb, Sn, Ni, Cu, Mg, Avial, steel, and brass, 9: 4143(J)

Hydrogen sulfides

absorption band at 4,900 cm^{-1} of D-labeled, 9: 1136(J)

effects of gaseous and liquid, on corrosion of Mg, Pb, Al, Fe, Zn, Ag, Ni, Cu, Avial, brass, and steel, 9: 4143(J)

radiation protection, 9: 2599(J)

Hydrogen–titanium systems

microstructure, 9: 1857

Hydrogen tritides
formation and relative abundance in atmosphere, 9: 126(J)

Hydrogen–tritium systems
preparation of standard samples for mass spectrographic analysis, 9: 3248

Hydrolysis
of metal ions, study of, 9: 1469(J)

Hyperfine structure
in nuclear resonance line shape, effect of chemical shift and J coupling on, 9: 1636(J)
theory, 9: 2523(J)

Hypotia
(See Anoxia.)

I

Ianthinites
alteration product of, from Katanga region (Belgian Congo), 9: 959(J)

Ice
gamma-irradiated, paramagnetic spectra, 9: 3423(J)
x-ray excited fluorescence and thermoluminescence of pure and impure, 9: 3095(J)

Ice-d_2
gamma-irradiated, paramagnetic spectra, 9: 3423(J)

Idaho (Cassia Co.)
radioactive carbonaceous shale and lignite deposits in Goose Creek District in, 9: 2263

Idaho (Clark Co.)
uranium and Th deposits in Birch Creek District in, 9: 1520(J)

Idaho (Jefferson Co.)
uranium and Th deposits, 9: 1520(J)

Idaho (Lemhi Co.)
uranium and Th deposits in Blackbird and Lemhi Pass Districts in, 9: 1520(J)

Idaho (Scott Co.)
uranium and Th deposits in, 9: 1520(J)

Igneous deposits (Ariz.)
occurrence in Ruby quadrangle, 9: 161

Illinois Inst. of Tech.
progress reports on investigation of imperfections in solids, 9: 3890(R)

Illinois Univ.
progress reports on effects of high-energy radiation on chemical systems, 9: 2657 (R)
progress reports on high-temperature-resistant ceramic coatings and ceramic and metal–ceramic bodies, 9: 4137(R), 4139(R)

Illium R Alloy
(See Nickel alloys.)

Impact shock
numerical solution of transient hydrodynamic shock problems in 2 space dimensions, 9: 3811
testing equipment for cermets, 9: 4140
design and performance of equipment for tensile and Charpy V-notch tests, 9: 2296

Incompressible flow
(See also Compressible flow.)
density gradient in, effect on Taylor instability, 9: 3446
stability conditions for spherically symmetrical, 9: 3442
two-dimensional, laminar viscous mixing of jets in, theoretical analysis, 9: 4130

Inconel
(See Nickel alloys.)

Indexes
subject headings used in catalogs of the AEC, 9: 2100

Indiana
exploration of coal field in, 9: 1515

Indiana Coal Field
exploration, U distribution, geology, 9: 1515

Indium
diffusion of, in single crystals of Ag, tracer study, 9: 668(J)
electroforming from fluoborate and sulfate baths, 9: 3495
photon scattering cross section, 9: 4205(R)
radiochemical determination, 9: 876
slow neutron cross sections, 9: 1391(J)
spectrographic determination of, in ores and rocks, 9: 162

Indium–aluminum–titanium alloys
hardness, crystal structure, and phase studies, 9: 3520

Indium bromides
chemical stability of, 9: 2157(J)

Indium chlorides
chemical stability of, 9: 2157(J)
crystal structure, 9: 544(J)

Indium complexes
formation in In–Br systems, 9: 2331(R), 4205(R)

Indium fluorides
chemical stability of, 9: 2157(J)

Indium foils
effect of orientation on neutron induced activity, 9: 2857(J)

Indium iodides
chemical stability of, 9: 2157(J)
preparation and crystal structure, 9: 2136(R)

Indium isotopes
electromagnetic concentration of stable, yields and equipment, 9: 2406
Szilard-Chalmers concentration, 9: 1959(J)

Indium isotopes In^{107}
gamma spectra from deuteron bombardment, 9: 734

Indium isotopes In^{113}
isomeric transition, 9: 2953(J)

Indium isotopes In^{114}
gamma spectra of, 9: 435(J)

Indium isotopes In^{115}
energy levels, 9: 1347(J), 3335(J)
isomeric transition, 9: 2953(J)

Indium isotopes In^{117}
decay schemes, 9: 2056(J)

Indium-nickel alloys
surface tension and wettability, measurements of, 9: 653(R)

Indium oxides
heat and free energy of formation, 9: 529(J)

Indium–thallium alloys
diffusionless phase transformation, crystal structure, heat treatment, and effects of tensile and compressive stresses, 9: 1861(R)
thermal conductivity of, at low temperature, 9: 3202(J)

Induction furnaces
(See also Furnaces; Heaters.)
choice and construction of monolithic linings for twin-bath, for melting Al alloys, 9: 3195(J)

Induction furnaces (cont'd)

design of high-frequency, for determining C^{14}, 9: 1476

Industrial management

quality control from field failure reports, 9: 1

Infections

(See also specific bacteria, diseases, organs, etc.)

radioinduced, 9: 2578(J)

radioinduced activation of latent Bartonella muris, in rats, 9: 1164(J)

Influenza virus

effects of x radiation on infectivity and hemagglutination properties, 9: 2106

Infrared radiation

(See also Thermal radiation.)

detection and measurement of, design and performance of apparatus for, 9: 3759(R)

effects of exposure to, on chromosomes in Drosophila, 9: 3021(J), 3023(J)

effects on doubly activated ZnS phosphors, 9: 431(J)

Infrared spectroscopy

applications to study of polymers, literature survey, 9: 3115

Instruments

(Common instruments are entered directly, e.g., Pressure gages; see also Electronic equipment.)

design and errors, 9: 2836(J)

nuclear fire detector, 9: 2832(J)

recording integrating photoelectric and radioactive scanner, 9: 2393(J)

(See also Electric insulators.)

Interferometers

(See also Optical systems; Spectrometers.)

electron, design of, 9: 1023(J)

electron, with three-crystal diffraction, theory, 9: 1024(J)

Rayleigh type, design, construction, and calibration, 9: 546

Intermetallic compounds

(See also specific intermetallic compounds, which are indexed with components both in alphabetical order; see also Alloys.)

corrosion, physical properties, testing and preparation, 9: 2740

intermediate phase studies and melting temperatures of Laves-type, 9: 2721(R)

intermediate phase studies and valence calculations of transition metals of Laves-type, 9: 2736

preparation and structures of Nb_3Sn, Nb_3Os, Nb_3Ir, Nb_3Pt, Ta_2Sn, and V_3Sn, 9: 3878(J)

Intestine

(See also Gastrointestinal tract.)

effects of thermal neutrons compared with effects of x radiation on, in rats, 9: 1711

indigenous flora of, relationship to radioinduced bacteremia in rats, 9: 2115(J)

lesions of, following exposure to total-body irradiation, effects on bacterial infection in mice

Inulin

biosyntheses of C^{14}-labeled, 9: 3(R)

Invar

(See Iron-nickel alloys.)

Iodide ions

adsorption of, on AgI in presence and absence of lauric acid, 9: 623(R) 3111(R)

transfer through mucosa of normal and artificially constructed bladders, tracer study, 9: 1732(J)

Iodine

chemical effects of (d,p), (n,2n), and (γ,n) activation of, 9: 1782(J)

Iodine (cont'd)

distribution in rabbit brain and metabolism in humans, tracer studies, 9: 2099(R)

effects of, on uptake of I^{131} by thyroid gland in rats, 9: 508(J)

effects of thyroxine and KSCN on accumulation of, by thyroid gland, 9: 1709(J)

distribution in tissues and milk in dairy cows, tracer study, 9: 1156(R)

metabolism of, by thyroid gland, effects of dietary fluorine, tracer study, 9: 2610(J)

molecular excited, exchange of vibrational and translational energy between, and rare gases, 9: 3571(J)

nuclear quadrupole coupling, 9: 1340(J)

solubility of, in a perfluoroamine and perfluoroether, 9: 95(J)

thyroidal clearance, tracer study, 9: 2603(J)

Iodine complexes

formation, 9: 4101(R)

Iodine isotopes

nuclear properties, 9: 735

Iodine isotopes I^{127}

spectrophotometric determination of, in the presence of At^{211} and I^{131} in excised thyroid tissue, 9: 1477

Iodine isotopes I^{131}

autoradiographic demonstration of tissue distribution of protein-bound, in thyroid gland of mice, 9: 1178(J)

clearance of, correlation with renal function, in hyperthyroidism and myxedema, 9: 1180(J)

distribution of, in thyroid and blood serum components following administration of therapeutic doses, 9: 1460(J)

early tissue distribution and renal excretion patterns, as a diagnostic aid, 9: 1463(J), 1464(J)

effects of ingested, on thyroid gland of salmon parr, 9: 828(J)

fission recoil of, from U oxide particles into KIO_3, chemical effects, 9: 3422(J)

histopathological effects of large doses of, on thyroid gland of dogs, 9: 1169(J)

improved techniques for use in thyroid-uptake studies, 9: 1737(J)

isodose measurements of γ radiation from, made over entire body, 9: 2605(J)

late effects of treatment on patients, 9: 1723(R)

localization in thyroid tissue, counting method, 9: 46(J)

pathological effects of, in rats, 9: 4039(R)

radiation from, histologic effects on thyroid gland of rats, effects of hypophysectomy and of thyroxine on, 9: 2113(J)

radiometric determination of, in the presence of At^{211} and I^{127} in excised thyroid tissue, 9: 1477

separation from irradiated tellurium dioxide, 9: 3796

therapeutic effects of, in treatment of hyperthyroidism and thyrotoxic myopathy, 9: 3749(J)

therapeutic uses of, calculation of blood radiation dose, 9: 1173(J)

thyroid deficiency following uptake of, effects on bone growth in mice, 9: 485(J)

thyroid uptake of tracer and therapeutic doses of, comparison, 9: 45(J)

tissue distribution in anesthetized and stimulated rabbit, 9: 2544(J)

tissue distribution of, in muscle and malignant melanoma tissue, 9: 3028(J)

uptake by thyroid gland, effects of administration of desiccated thyroid on, 9: 507(J)

uptake by thyroid gland, effects of liver diseases on, 9: 499(J)

uptake by thyroid gland, effects of phenothiazine and of free iodide on, in rats, 9: 508(J)

uptake by thyroid gland of hypophysectomized rats, effect of direct and explant-transplants of anterior pituitary, 9: 1733(J)

uptake of, by thyroid gland, diagnostic applications, 9: 3047

Iodine isotopes I^{132}

metabolism of mixtures of Te^{132} and, in rats and guinea pigs, 9: 3754(J)

production of, equipment modifications, 9: 2099(R)

thyroid uptake of, in diagnosis of thyroid diseases, tracer study, 9: 1179(J)

Ion beams

(See also specific particle beams, e.g., Proton beams; Helium ion beams (He^3); see also appropriate subheadings under Accelerators and specific accelerators.)

application of intense, for excitation of gases, design and performance of apparatus for, 9: 2477(J)

charge states of, passing through gases, 9: 992(J)

desorption of positive, by electrostatic fields, 9: 988(R)

dissociation of negative molecular ions in gases, 9: 2933(J)

dynamic pressure stage elements for projection of intense monokinetic, into gases at high pressure, design and performance of equipment, 9: 2475(J)

energy spectrum of canal-ray ions, calculation and measurement, 9: 4213(J)

mathematical analysis in linear accelerators, 9: 397(J)

measurement of gas density with, 9: 1940(J)

negative, production and measurement of scattering, apparatus for, 9: 2471

Ion exchange

and adsorption in metal-metal ion systems, review, 9: 121(J)

from lithium chloride solutions, 9: 3103(J)

review, 9: 3106(J)

review of new developments in, 9: 68(J)

theory, 9: 3769(J)

Ion exchange materials

(See also Anion exchange materials; Cation exchange materials.)

adsorption of metals by anion-type, 9: 2331(R)

behavior of, in liquid ammonia, 9: 515

effectiveness of, in removal of amine, ammonia-type organic arsenates, and phosphate-type chemical warfare agents from water supplies, 9: 914

osmotic behavior, 9: 3099(J)

preparation, moisture content, capacity, yield strength, thickness, and potential measurements of membranes of polystyrenesulfonic acid type, 9: 1753(J)

swelling of resins in mixtures of water and methanol, ethanol, isopropyl alcohol, and dioxane, 9: 1750(J)

Ion exchange processes

for separation of alkali metals in EDTA solutions, 9: 2214(J)

thermodynamic theory of, 9: 116

Ion exchangers

capacity and leakage of ion exchange columns, 9: 1482(J)

design and performance, 9: 910(J)

design and performance of, using phosphorylated cotton, 9: 3104(J)

effect of form of, on separation of rare earths, 9: 113(J)

selective behavior of, 9: 118(J)

Ion pair production

by fast primary particle, derivation of distributions, 9: 4003(J)

Ion sources

(Covering radiation from nonradioactive sources; see also headings identified by radiation, e.g., Neutron sources; see also appropriate subheadings under specific accelerators.)

design, 9: 1442(P)

design and performance of, for 184-in. cyclotron, 9: 3662

design of, for electromagnetic separation of Sr isotopes, 9: 1593

design of high-frequency, 9: 1583(J)

design of high-current pulsed, for Van de Graaff accelerator, 9: 3666(J)

design of high-intensity, 9: 1587(J)

Ion sources (cont'd)

design of improved, for mass spectrometers for analysis of solids, 9: 1595(J)

design of point field-emission, for mass spectrometry, 9: 2136(R)

hydrogen, measurement of variables, 9: 2388(J)

mass-spectrometer, electron current and energy regulator for, 9: 1031(J)

for mass spectrometer, trap-current controlled emission regulator for, 9: 2408

for negative ions, design, 9: 2471

pulsable, design, 9: 3307(J)

r-f, performance, 9: 4204(R)

Ionization

(See also Dissociation; see also appropriate subheadings under Gases and under specific materials and radiations.)

energy loss of a fast primary particle by, derivation of distributions 9: 4003

gaseous, dual gage for, design and performance, 9: 2820(R)

probability curves of, apparatus for obtaining, 9: 999(J)

Ionization chambers

behavior of flat-plate type, under continuous α irradiation, 9: 1968(J)

calibration of 50- and 900-cc, 9: 3924

characteristics of gridded parallel-plate, 9: 1599

cosmic ray, design, 9: 1066(R)

design and filling equipment, 9: 3965(R)

design and performance, 9: 318(J)

design and performance for integral dose measurements in betatron radiation therapy, 9: 2878(J)

design for β-γ radioactivity of the atmosphere, 9: 1326(J)

design of Kanne chamber for measuring radiogases, 9: 1038

design of pocket integrating, of nearly uniform polar response, 9: 4249(J)

for detection of neutron flux in a reactor, design, 9: 3589

electrostatic fields of, measurement of distortion produced in guarded, by grounded external plates, 9: 314(J)

filling with A–N_2 mixtures, advantages, 9: 3949(J)

performance, 9: 2539(R)

performance of, for dosimetry of small high-energy x-ray beams, 9: 2879(J)

performance of, for measurement of Co^{60} γ radiation, 9: 1978(J)

performance of, in determinations of radiation dosage in tissues, 9: 3256(J)

performance of, in measurement of C^{14}–activity from human breath, 9: 3940(J)

performance in fission counting, 9: 2821

portable, for radon measurements, design of, 9: 2855

preparation and properties of thin polyvinylchloride-acetate copolymer films for 4π counting in, 9: 1613(J)

standard free-air, plate separation requirements, 9: 1331(J)

tissue-equivalent, for detection of fast neutrons, performance, 9: 3951(J)

Ions

(See also Anions; Cations; Gaseous ions.)

colorimetric determination, annular oven method and spot testing in, 9: 3781

effects of, on the nucleation processes in liquids, 9: 2663(J)

electron capture and loss by moving, in dense media, 9: 1563(J)

electronic polarizabilities of, from the Hartree-Fock wave functions, 9: 991(J)

metal, polynuclear hydrolysis reactions of, 9: 1469(J)

positive, quantitative detection by electron multiplier, 9: 1051(J)

separation of, in a single drop, 9: 1786(J)

Ions (cont'd)

simple analytic wave functions for configurations $(1s)^2(2s)$ and $(1s)^2(2s)^2$ in, from He to C, 9: 4339(J)

single ion free energies and entropies of aqueous, 9: 2142(J)

tables of statistical electron distributions for, and corresponding electrostatic potentials, 9: 69(J)

Iowa State Coll.

progress report on organo-metallic and organo-metalloidal high temperature lubricants and related materials, 9: 4091(R)

progress reports on thermal decomposition of lubricants, 9: 3805(R)

Iridium

complexes, magnetic moments of octahedral, 9: 1749(J)

determination of, as sulfide, 9: 82(J)

intermetallic compound with Nb, preparation and structure, 9: 3878(J)

nuclear isomers, 9: 1067(R)

Iridium fluorides

preparation of complex, 9: 2188(J)

Iridium isotopes

exchange of radioactive, between $IrCl_6^{-2}$ and $IrCl_6^{-3}$ ions in 1 f HCl, 9: 3770(J)

Szilard-Chalmers concentration, 9: 1959(J)

Iridium isotopes Ir^{191}

identification of 0.125-Mev x radiation from, 9: 436(J)

nuclear properties, 9: 1356(J)

nuclear properties, decay scheme, and energy levels, 9: 1355(J)

Iridium isotopes Ir^{192}

disintegration, 9: 1677(J)

gamma spectra, 9: 988(R)

photon and electron spectra of Ir^{192}, 9: 438(J)

radiographic applications, 9: 2241(J)

Iridium isotopes Ir^{194}

decay scheme, 9: 4329(J)

disintegration, 9: 1677(J)

Iridium–platinum alloys

number of vacancies and energy of vacancy formation in, 9: 3525(J)

Iron

(See also Cast iron; Steel.)

adsorption of O_2, H_2, and CO on evaporated films of, 9: 2159(J)

angular distribution, cross sections, and γ rays excited by scattered neutrons, 9: 3993(R)

corrosion by water, texture of γ-$Fe_2O_3 \cdot H_2O$ crystals from, 9: 886(J)

corrosion in 1000°F liquid Na, effect O_2 on, 9: 948

corrosion of, inhibition by pertechnetate, 9: 1825

corrosion prevention of, by metal spraying, 9: 3150(J)

corrosion testing, methods for cleaning exposed specimens for, 9: 952(J)

cosmic shower production in, 9: 2814(J)

cross sections for neutron transmission and multiplication, 9: 3646(J)

curved-crystal x-ray spectrometric microdetermination of, in Al alloys, 9: 3435(J)

detection of inclusions of, in Al by colorimetric spot tests, 9: 1196

determination in Fe alloys, 9: 1901(R)

determination in U by ion exchange, 9: 884(J), 1793(J)

determination of, in high-temperature alloys using anion-exchange separations, 9: 1544(J)

determination of, in mixtures with Th, Zr, and Ti, by use of 2,4-dichlorophenoxyacetic acid, 9: 2641(J)

diffusion of H_2 in, 9: 2297

diffusion of hydrogen in, 9: 3191(J)

effects of H on, 9: 1272(J)

electroforming from ferrous chloride and fluoborate baths, 9: 3495

electron emission from, bombarded by hydrogen ions, 9: 250(J)

Iron (cont'd)

electroplating and roll-bonding to Ti, 9: 3477(R)

external bremsstrahlung emitted from P^{32} β rays stopped in, 9: 2505(J)

fatigue and stress, 9: 4159

fatigue, minimum scatter in, 9: 1816

film-surface area of evaporated, measurement, 9: 3887(J)

gamma attenuation, 9: 1656, 2983

gamma penetration, tables and graphs, 9: 2472

inelastic neutron scattering in, γ spectra from, 9: 419(J)

large angle scattering of μ mesons in, 9: 3322(J)

μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)

metabolism, effects of total-body x irradiation on, in duck erythrocytes, 9: 2580(J)

neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)

neutron inelastic scattering cross section, 9: 988(R)

neutron reactions (n,γ), theory, 9: 3619(J)

nuclear and magnetic scattering amplitudes for, from neutron polarization studies, 9: 1658(J)

passive film on, electrical field within, 9: 1868(J)

polarization of thermal neutrons by noncrystalline, 9: 1627(J)

potentiometric determination of, by x-ray oxidation of ferrous solutions, 9: 2644(J)

purification by zone melting, 9: 1855(R)

radiochemical determination, 9: 876

radiometric determination, 9: 2634

reaction with fused NaOH, 9: 1466(R)

removal of layers of, from Ni by electrolytic polishing, 9: 3874

separation from Pa by ion exchange in HCl–HF solutions, 9: 3102(J)

slowing down of Ra-α-Be neutrons, 9: 1105

solubility in NaK, equipment and procedures for studying, 9: 3501

specific heat of, to 600°C, 9: 185

spectrographic determination in Bi, 9: 1475

spectrographic determination in Ti and Ti alloys, 9: 639(R)

spectrophotometric determination of, in presence of U with 1,10-phenanthroline, 9: 4074

spectrophotometric determination of, in Ti alloys, 9: 84(J)

tissue distribution of subcutaneously injected, in young rats, effects of radiation on, tracer study, 9: 3050(J)

tritium production by 2.2-Bev protons on, and its relation to cosmic radiation, 9: 3651(J)

uptake by human bone marrow cells, tracer study, 9: 3011(J)

uptake of, by blood cells, effects of whole-body x irradiation on, in ducks, 9: 1155

uptake of, by erythrocytes in bone marrow, tracer study, 9: 3007

urinary excretion of, effects of Na diethanolamine acetate on, 9: 1739

x-ray spectra (soft), 9: 452(J)

Iron alloys

casting and forging for gas turbine application, 9: 3869

corrosion by liquid Na, 9: 1902(R)

corrosion of Globeiron by liquid Na, 9: 1901(R), 1903(R)

descaling methods for, corroded by high-temperature water, 9: 154

fatigue and stress, 9: 4159

Globeiron, heat transfer and corrosion tests on, 9: 2776(J)

Globeiron fuel cladding for a Na-cooled fast reactor, tests, 9: 2776(J)

production, physico-chemical principles of, 9: 640

rupture and tensile tests on wrought Fe-Mn-Cr austenitic steel and cast F-88 and F-87 alloys, 9: 2720(R)

Iron–aluminum alloys

thermodynamic properties, 9: 2294(R)

Iron–aluminum–beryllium compounds (intermetallic)
crystal structure, 9: 2310(J)

Iron–aluminum compounds (intermetallic)
crystal structure, 9: 2311(J)

Iron–aluminum–titanium alloys
fabrication and physical properties, 9: 2717(R)
hardness, crystal structure, and phase studies, 9: 3520

Iron–carbon–cobalt systems
diffusion of C in, influence of Co, 9: 1869(J)

Iron–carbon–nickel systems
phase studies, 9: 2317(J)

Iron–carbon systems
preparation, microstructure, and phase studies, 9: 1265(R)
size of interstitial solute atoms, lattice expansion and electronic properties of close-packed, 9: 1780(J)
surface tension, 9: 2702(R)

Iron carbonyls
powders, density measured by gas burette, 9: 1290(J)

Iron–chromium alloys
creep, heat treatment, and tensile properties, 9: 2724
dilatometric determination of $\alpha \rightleftharpoons \sigma$ transformation, 9: 3537(J)
forgeable high-strength, high-temperature, preparation of, effects of additives, 9: 3522
neutron-diffraction studies of magnetic structure of, 9: 2312(J)

Iron–chromium–cobalt–nickel alloys
analysis of, using anion-exchange separations, 9: 1544(J)
weldability of wrought, 9: 3530(J)

Iron–chromium–manganese–molybdenum–titanium alloys
mechanical properties and microstructure of extruded and heat treated, effects of temperature, pressure, and die angle on, 9: 2276(R)

Iron–chromium–manganese–molybdenum–titanium–vanadium alloys
heat treatment, mechanical properties, phase studies, tensile properties, and welding, 9: 2298
tensile properties, hardness, and flash weldability, 9: 3856

Iron–chromium–molybdenum–nickel alloys
tensile properties, creep-rupture at 1350 and 1500°F, and microstructure, 9: 3859

Iron–chromium–molybdenum–titanium alloys
tensile properties and ductility, 9: 1848(R)

Iron–chromium–nickel alloys
vacuum melting and casting, 9: 2727(R)

Iron–chromium–titanium alloys
creep of heat-treated and as-received, at 76 and 600°F, 9: 3478(R)
creep of hot-rolled and annealed, at 76 and 600°F, aging effects on, 9: 3479(R)
creep of Ti 150A, 9: 168(R)
drilling tests, 9: 3544(J)
effects of creep testing on room-temperature tensile properties of heat-treated and hot-rolled, 9: 2279(R)
machining and grinding, 9: 4174
machining characteristics of forged Ti-150A, 9: 4168
tensile properties and rupture at 800°F of hot-rolled, 9: 2275(R)
tensile properties at room temperature, effects of creep test conditions on, 9: 2275(R)

Iron complexes
with 2,2-bipyridine, chemical properties, 9: 512

Iron(II) compounds
aqueous, x-ray oxidation of, potentiometric determination of Fe by, 9: 2644(J)

Iron cyanides
isotopic exchange reactions between ferrocyanide-ferricyanide, 9: 530(J)

Iron(II) fluorides
crystal structure, 9: 92(J)

Iron–germanium alloys
phase studies, 9: 3184(J)

Iron hydrides
preparation of, by reaction with atomic H, 9: 635(R)

Iron ions
equilibrium formation constants for reaction in aqueous solution of acetylacetonate ion with, 9: 1752(J)

Iron(II) ions
oxidation, determination of G values for, 9: 899

Iron(III) ions
photoinitiated oxidation of benzoic acid by, in aqueous solution, 9: 3061
x-ray photometric determination of, 9: 899

Iron isotopes Fe^{55}
bremsstrahlung from radiative electron capture, 9: 401(R)

Iron isotopes Fe^{56}
proton inelastic scattering from, direct interaction in, 9: 1114(J)

Iron isotopes Fe^{57}
Coulomb excitation functions and energy levels for, bombarded with 3.5-Mev α particles, 9: 423(J)

Iron–molybdenum alloys
catastrophic oxidation of, effect of Ni and Cr on, 9: 1275(J)
oxidation kinetics, 9: 1274(J)

Iron–molybdenum–nickel alloys
oxidation at 920 and 1110°C, 9: 3146

Iron–molybdenum–titanium alloys
hardness, heat treatment, mechanical properties, phase studies and welding, 9: 2298

Iron–nickel alloys
diffusionless phase transformation and crystal structure, 9: 1861
magnetic properties, 9: 1067(R)
neutron-diffraction studies of magnetic structure of, 9: 2312(J)

Iron–nickel compounds (intermetallic)
superlattice formation of, in steady temperature annealing, 9: 2773(J)

Iron–nickel–uranium alloys
pseudo-binary phase sections between Laves phases in, 9: 3353(J)

Iron–niobium alloys
potassium carbonate fusion of, for production of Nb_2O_5, 9: 2666

Iron nitrides
precipitation of, in isothermal annealing of carbonyl Fe powders, 9: 186

Iron–nitrogen systems
size of interstitial solute atoms, lattice expansion, and electronic properties of close-packed, 9: 1780(J)
surface tension, 9: 2702(R)
surface tension and wettability, measurements of, 9: 653(R)

Iron oxide crystals
texture of, from corrosion of Fe by water, 9: 886(J)

Iron oxides
heat and free energy of formation, 9: 529(J)
isotopic equilibration determination of O in, 9: 3394

Iron–oxygen systems
isotopic equilibration determination of O in, 9: 3394
surface tension, 9: 2702(R)

Iron–oxygen–titanium systems
phase studies, 9: 1874(J)

Iron powders
effects of isothermal annealing on structure and properties of, x-ray-diffraction studies, 9: 1862(R)
Iron–selenium systems
surface tension, 9: 2702(R)
Iron sulfate-copper sulfate systems (liquid)
radiation chemistry of aqueous solutions of, 9: 2661(J)
Iron(II) sulfates
absolute yield of Fe^{3+} from dilute aqueous solutions of, exposed to 200-kv x rays, 9: 108(J)
radioinduced oxidation of, 9: 899
Iron sulfides
molten, self-diffusion of Fe, 9: 1467(R)
self-diffusion coefficient of Fe in molten, 9: 2135(R)
Iron–tellurium systems
surface tension, 9: 2702(R)
Iron titanates
crystal structure, 9: 3844(R)
Iron–titanium alloys
electric resistance, phase studies, and microstructure of heat-treated, 9: 975
grain-boundary diffusion in, as bonding agent between Ti and steel, 9: 4182
martensite formation and hardness in powders and lump specimens of, 9: 1547(J)
mechanical properties, effect of microstructure, 9: 4172
oxygen content and oxide phase equilibrium with, 9: 1546(J)
Iron–titanium–vanadium alloys
fabrication and physical properties, 9: 2717(R)
microstructure, hardness, and tensile properties of welded and unwelded, 9: 3493(R)
Iron–zirconium alloys
creep-rupture, 9: 190(R)
Irradiation chambers
(See Radiation exposure chambers.)
Irradiation techniques
for cyclotron radiation damage studies, 9: 430(J)
Isomeric transition
(See also appropriate subheadings under specific isotopes.)
electric dipole, isotopic spin selection rule for, 9: 4325(J)
energy of Ir^{193m}, from conversion electron studies, 9: 438(J)
Isonipecotic acid, 1-methyl- 4-phenyl-, ethyl ester chlorohydrates
x ray protection of guinea pigs injected with, 9: 43(J)
Isopropyl ether
radiolysis of, with γ rays, comparison with He-ion and electron irradiations, 9: 61(R)
Isotope effects
statistical thermodynamics of, 9: 1418
Isotope separation methods
(See also appropriate subheadings under specific isotopes.)
bibliography on, 9: 288
chemical separation of isotopes as a problem of rectification, 9: 1960(J)
electrolysis, 9: 289
electrolytic, for separation of H isotopes, 9: 1435(P)
electrolytic separation of H and D, effect of nitrate ion and NH_3 on, 9: 1594(J)
electromagnetic apparatus and collection of gaseous isotopes, 9: 3247
nuclear recoil, 9: 1958(J)
for separation of N isotopes by ion exchange, 9: 3246(J)
using countercurrent chemical exchange, theory, 9: 2838
Isotope separation methods (cont'd)
using Szilard-Chalmers reactions in metal complexes of phthalocyanine, 9: 1959(J)
Isotopes
(See also specific isotopes; see also Radioisotopes; Stable isotopes; Tracer techniques.)
electromagnetically enriched non-radioactive, production at Harwell, 9: 2403(J)
enriched non-radioactive, production at Oak Ridge National Lab., 9: 2402(J)
migration and selfmigration in metals, 9: 1954(J)
properties and applications in the field of physical chemistry, review, 9: 3582(J)
relative abundance of, in earth's crust, effect of diffusion, 9: 3464(J)
table of α-decay energies for heavy, 9: 806(J)
Isotopic equilibration
dilution method for chemical analysis, 9: 3783(J)
Isotopic equilibration analysis
of O in metals and metal oxides, design and performance of equipment for, 9: 3394
Isotopic exchange
between tricalcium phosphate and Ca or phosphate solutions, 9: 90(J)
bibliography on, 9: 288
complex reaction mechanisms, theoretical treatment of, 9: 1182
kinetics of, under dynamic conditions, 9: 3767(J)
kinetics of, with appreciable isotope effect, 9: 1030(J)
reaction kinetics, 9: 3391
Italy
nuclear research programs, 9: 2908(J)

J

Jaw Bone Mining District (Calif.)
geology, mineralogy, and uranium distribution, 9: 3154
Jeep No. 2 Claim (Calif.)
geology and U distribution, 9: 2708
JEEP Reactor
neutron flux distribution in concrete shield, 9: 749
temperature measurements and reactivity, 9: 3976
transfer function of, effect of photoneutrons on, 9: 1084(J)
velocity distribution of escaping neutrons from, measurements, 9: 3980(J)
Jet engine fuels
cleaning, 9: 136(R)
Jet Propulsion Lab., Calif. Inst. of Tech.
progress reports on a constitution diagram for Ti–Sn alloy, 9: 2281(R)
Jet pumps
design, 9: 1818(J)
Joe Davis Hill Quadrangle (Colo.)
preliminary geologic map of, 9: 4153(J)
Johns Hopkins Univ.
progress reports on nuclear γ rays, 9: 401(R)
Joint Establishment for Nuclear Energy Research (Norway)
progress reports on research, 9: 3717(R)

K

K particles
beta decay of, 9: 325(J)
capture of K^- mesons, 9: 4262(J)
decay and production by 5.7-bev protons, 9: 3966(R)

K particles (cont'd)
decay of, into a π meson and four electrons, possible observation of, 9: 1059(J)
decay of, to a 50-Mev electron, 9: 724(J)
decay studies, 9: 2099(R)
detection of nuclear capture of, at 1750 m, 9: 1607(J)
mass measurements of, and decay products, 9: 2890(R)
negative, observations on, 9: 3272(J)
nuclear interactions, 9: 3960(J)
observation by counter selection system and cloud chamber, 9: 3955(J)
observation of, in decay of hyperon Y_1^-, 9: 339(J)
review of, in Annual Review of Nuclear Science, 9: 3957(J)
Kaiparowits Peak Quadrangle (Utah)
photogeologic map of, 9: 3469(J), 3835(J)
Kaiparowits Plateau Area (Utah)
exploration, 9: 3466(J)
Kansas
radioactivity in oil deposits in, in Butler, Cowley, Greenwood, Marion, and Sedgwick counties, 9: 1517(J)
Kentucky Research Foundation, Univ. of Ky.
progress reports on preferred orientations and deformation in Ti and Ti alloys, 9: 1836(R)
Kerosene–acetone, thenoyltrifluoro-–butyl phosphate systems
solvent extraction of Pr and Nd in, 9: 906
Kerosene–butyl phosphate systems
mechanism of U extraction by, 9: 585
solvent extraction of Pr and Nd in, 9: 906
Ketones
(See also Diketones.)
enolization, tritium isotope effect for hydronium ion catalysis, 9: 4205(R)
Kidneys
effects of total-body irradiation on, in chickens, 9: 3(R)
effects of tubular injury on urinary excretion of fluoride by, in the rabbits, 9: 1730(J)
function of, correlation with I^{131} clearance in hyperthyroidism and myxedema, 9: 1180(J)
radiosensitivity of, in rats, 9: 2547(R)
Kilns
(See also Furnaces; Ovens.)
rotary, for production of zirconia, 9: 151(J)
King Tut Mesa (Ariz.–N. Mex.)
exploration and geology, 9: 2262(R)
Kinusta Mesa (Ariz.)
stratigraphy, 9: 2262(R)
Kolob Terrace Area (Utah)
exploration, 9: 3466(J)
Koyukuk District (Alaska)
prospecting and geology, 9: 628(J)
Krypton
absorption on Al powders for measurement of surface areas, 9: 4163(R)
adsorption on rutile, 9: 3113(J)
energy loss of positive ions single scattered in, 9: 1377(J)
ionic species formed by collision of gaseous ions in, 9: 1378(J)
solidified, compressibilities at low temperature, 9: 2824(J)
Krypton isotopes
decay schemes, measurements and interpretation, 9: 3332(J)
Krypton isotopes Kr^{79}
disintegration, 9: 1413(J)
Krypton isotopes Kr^{85}
counting of, techniques and equipment, 9: 300

L

Laboratories
(See also Caves.)
design of, for radioisotope work, 9: 4098(J)
for handling and machining irradiated samples, design, 9: 553(J)
high-radiation-level analytical, design, 9: 550(J)
for industrial atomic control analysis and development work, design, 9: 898
low-level radiation metallurgy, design, 9: 551(J)
for radiochemistry and metallurgy, design, 9: 554(J)
for radium processing, design, 9: 552(J)
for remote processing of reactor fuel elements, design, 9: 558(J)
Laboratories for Research and Development, Franklin Institute
progress reports on structure and properties of Fe powders prepared by carbonyl process, 9: 1862(R)
progress reports on study of purification and substructure formation of metals and semiconductors and the properties of high-temperature metals, 9: 1855(R)
Laboratory equipment
(See also Remote-control equipment; Servomechanisms.)
large volume cell for titrations and conductometric analyses, design, 9: 4094
master-slave manipulator, design, 9: 555(J), 556(J), 557(J)
microforceps, pneumatically controlled, design, 9: 3092(J)
noncorrosive, effectiveness of graphite as a structural material, 9: 3421(J)
for radiochemistry procedures, design, 9: 576(J)
for remote chemical separations, design, 9: 570(J), 571(J)
for remotely-controlled pipetting of micro-amounts, design, 9: 559(J)
Laboratory for Nuclear Science, Mass. Inst. of Tech.
progress reports, 9: 1066(R)
progress reports on nuclear chemistry and physics, 9: 2331(R)
progress reports on nuclear science, 9: 4205(R)
Laboratory furniture
(Including hoods, benches, sinks, etc.; see also Dry boxes.)
a self-contained unit for collecting and disposing of chemical fumes, mists, and gases, design, 9: 932
Lactates
degradation of C^{14}-labeled, using a combined combustion-diffusion vessel, 9: 2178(J)
Lactic acid
electroösmosis of, in paper electrochromatography with electrodes on paper, 9: 1221(J)
Lactones
reduction of, by sodium amalgam, 9: 3117
Laguna Area (N. Mex.)
mineralogy, 9: 1829
Lanthanum
absorption on clay as simulants for nuclear detonations in harbors, 9: 658
determination by Cu-spark spectroscopy, 9: 885(J)
spectrographic determination of, in ores and rocks, 9: 162
tissue distribution of, in rats, tracer study, 9: 3730(R)
Lanthanum chelates
with 8-quinolinol, precipitation of, 9: 63(J)
Lanthanum compounds
with cyclopentadiene, 9: 3096(J)
toxicity, 9: 845(J)

Lanthanum–copper compounds (intermetallic)
crystal structure, 9: 683(J)

Lanthanum ions
activity measurements in $LaCl_3$ solutions with resin membrane electrodes, 9: 2150(J)

Lanthanum Isotopes La^{139}
nuclear magnetic moments, 9: 4278(J)

Lanthanum isotopes La^{140}
gamma spectra, 9: 4333
half life, 9: 467(J)

Lanthanum–magnesium compounds (intermetallic)
crystal structure, 9: 683(J)

Lanthanum–nickel compounds (intermetallic)
crystal structure, 9: 683(J)

Lanthanum nitrates
preparation of anhydrous, by reaction of oxides and NO_2, 9: 112(J)

Lanthanum oxide–zirconium oxide systems
heat treatment, phase studies and thermal expansion, 9: 3141(J)

Lanthanum oxides
rapid extraction from rare earths with nitric acid and NH_3 gas, 9: 902(J)

Lanthanum oxychlorides
phosphors, activated with Bi, Sb, and Sm, spectra of, 9: 2670(J)

Lanthanum–zinc compounds (intermetallic)
crystal structure, 9: 683(J)

Las Vegas District (N. Mex.)
exploration of, U distribution, 9: 955(J)

La Ventana Area (N. Mex.)
uranium bearing coal and carbonaceous shale in, 9: 2263

La Ventana Mesa (N. Mex.)
uranium distribution, 9: 2709

Leaching
(See also appropriate subheadings under materials leached; see Uranium leach solutions.)
review, 9: 3162(J)

Lead
absorption of cosmic μ mesons, 9: 721
adsorption on sphalerite, 9: 3111(R)
angular distribution, cross sections, and γ rays excited by scattered neutrons, 9: 3993(R)
chromatographic determination of, in soil samples, 9: 3404(J)
corrosion by hydraulic fluids, 9: 2795(R)
corrosion characteristics, 9: 2253(J)
corrosion testing, methods for cleaning exposed specimens for, 9: 952(J)
cosmic ray absorption in, at varying altitude, 9: 678(J)
cosmic shower production in, 9: 2814(J)
coulometric and polarographic determination of trace amount of, 9: 1205(J)
cross sections for neutron transmission and multiplication, 9: 3646(J)
detection of inclusions of, in Al by colorimetric spot tests, 9: 1196
diffusion in AgBr, 9: 1189(J)
elastic scattering of 22-Mev α particles from, 9: 2937(J)
electric properties of, for nuclear batteries, 9: 266
electroforming from fluoborate baths, 9: 3495
electron emission from, bombarded by hydrogen ions, 9: 250(J)
energy loss of secondary electrons in a cavity with walls of, 9: 2045(J)
excretion of, effects of Ca EDTA on treatment of, 9: 1739
external bremsstrahlung emitted from P^{32} β rays stopped in, 9: 2505(J)
fast neutron scattering by, 9: 3309(J)
galling and seizing of, by friction coefficients, 9: 1269

Lead (cont'd)
gamma attenuation, 9: 1656, 2963
gamma penetration, tables and graphs, 9: 2472
mean free path of heavy cosmic ray primaries, 9: 1296(J)
μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)
neutron-diffraction studies of superconducting state, 9: 3218(J)
neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)
neutron polarization by scattering from, 9: 2042(J)
nuclear magnetic moments, 9: 2895
photon scattering cross section, 9: 4205(R)
photoneutron yield, measurement with NaI crystal, 9: 3944(J)
photonuclear reactions, 9: 2449(J)
polishing of, with alumina abrasives, technique, 9: 3879(J)
proton stopping cross section, 9: 2026
purification, flowsheet for, 9: 3111(R)
quantitative determination of divalent, using a high-frequency oscillator and ethylenediaminetetraacetic acid, 9: 2169(J)
radiometric determination, 9: 2634
range of cosmic protons in, 9: 1922
scattering and absorption of 50-Mev π^+ mesons in, cross sections, 9: 2929
self-diffusion coefficient in Ag–Pb alloys
as shielding for burned-out reactor fuel elements, calculations, 9: 2904
slowing down of polarized protons by, 9: 2039
solubility of, in molten $PbCl_2$, 9: 3052
spectrographic determination in Bi, 9: 1475
spectrographic determination of, in ores and rocks, 9: 162
spectra, isotope shift in, 9: 1415(J)
three-quantum annihilation of positrons in, 9: 249(J)

Lead (liquid)
diffusion and self-diffusion of Be(liquid) in, 9: 179
diffusion in molten Bi–Pb alloys, 9: 179

Lead alloys
corrosion testing, methods for cleaning exposed specimens for, 9: 952(J)
spectrophotometric determination of Bi in, containing Sb, Sn, Cu, As, Ni, and Fe using Na diethyldithiocarbamate, 9: 2172(J)

Lead–bismuth alloys
segregation of impurity Po to grain boundaries, 9: 3186(J)

Lead–bismuth alloys (liquid)
diffusion of Pb and Bi in, tracer techniques, 9: 179

Lead chloride–potassium chloride systems (liquid)
electric conductivity, 9: 2139(J)

Lead chlorides (liquid)
solubility of Pb in, 9: 3052
transport numbers in, measurement, 9: 1219(J)

Lead fluoride crystals
growth of from the melt, 9: 3414(J)

Lead fluorides
crystal structure and optical properties, 9: 3414(J)

Lead(II) ions
adsorption of, from hydrochloric acid, nitric acid, and ammonium nitrate solutions with a strong base quaternary amine anion-exchange resin, 9: 1226(J)

Lead isotopes
decay schemes of neutron-deficient, 9: 3689(J), 3690(J)
electromagnetic separation, 9: 1592
isomeric levels and transitions of neutron-deficient, 9: 3688(J)

Lead isotopes Pb^{202}

formation, decay properties, and half life, 9: 364(J)

Lead isotopes Pb^{204}

energy levels, 9: 2963(J)

energy levels of gyromagnetic ratio, nuclear magnetic moment, and angular correlation of Pb^{204m}, 9: 3278(J)

nuclear magnetic moment, 9: 988(R)

Lead isotopes Pb^{206}

formation, decay properties, and half life, 9: 364(J)

Lead isotopes Pb^{208}

ratio of, to Pb^{207} in earth and meteorites in calculations of age of earth, 9: 1835

Lead isotopes Pb^{207}

angular correlations, 9: 1067(R)

deuteron reactions (d,p), proton angular distributions from, 9: 762(J)

neutron excitation of 0.8-sec metastable state of, cross section for, 9: 3678(J)

ratio of, to Pb^{208} in earth and meteorites in calculations of age of earth, 9: 1835

Lead isotopes Pb^{209}

radioactivity, 9: 2500

Lead isotopes Pb^{210}

half life, 9: 3693(J)

Lead isotopes Pb^{212}

half life, 9: 2962(J)

milligram radium equivalent of, 9: 1342(J)

Lead–magnesium alloys

corrosion properties and electrode potentials of, in various media, 9: 4143(J)

Lead oxides

electrical properties of, for nuclear batteries, 9: 267(R)

heat and free energy of formation, 9: 529(J)

Lead sulfides

adsorption by electrochemical studies of, 9: 3111(R)

Lead titanates

compacted with Sr titanates, dielectric and thermal properties and lattice dimensions of, 9: 2704(J)

dielectric and thermal properties and lattice constants of, containing Sn^{4+} ions, 9: 2705(J)

x-ray and neutron-diffraction study of, 9: 3238(J)

Lead–titanium alloys

preparation and phase studies, 9: 1872(J)

Leak detectors

design, 9: 1428(P)

hydrogen Pirani, using a charcoal trap, design, 9: 4233(J)

performance, for detecting Na leaks in vertical piping, 9: 605

use of halogen effect for sensitive, 9: 3454(J)

Leaves

of strawberries, uptake of Ca and P, tracer study, 9: 3751

Lemhi Pass District (Idaho–Mont.)

exploration for U and Th deposits in, 9: 1520(J)

Leucine

metabolism of, in Co^{60}-irradiated mice, 9: 61(R)

Leukemia

case history of, in a patient with thyroid carcinoma treated with I^{131} and x radiation, 9: 3019(J)

chronic, comparison of results of total-body spray x irradiation and P^{32} internal irradiation, 9: 3037(J)

chronic lymphatic, effects on liver blood flow, tracer study, 9: 2609

glycolytic rate in leukocytes, effects of enzymes on, 9: 6

Leukemia (cont'd)

incidence of, among atomic bomb survivors in Hiroshima, 9: 2586(J)

radioinduced, in mice, 9: 4047(J)

transfer of, in mice, factors affecting, 9: 3748(R)

Leukocytes

migration, effects of x irradiation on, in rats and rabbits, 9: 2577(J)

normal and leukemic, glycolytic rate in, effects of enzymes on, 9: 6

phagocytic indices, effects of x irradiation on, in rats, 9: 2578(J)

protective effects of granulocytes in radiation injury, 9: 1720

relationship between granulocyte count and survival following midlethal irradiation in mice, 9: 39(J)

Leukopenia

radioinduced, recovery from, 9: 1720

radioinduced, treatment with alkoxyglycerols, 9: 1455(J)

Level indicators

design, 9: 4039(R)

for liquid metals, design, 9: 4231

Light

measurement of time varying absorption of, 9: 2348(J)

scattering functions for spherical colloidal particles, tables, 9: 4299

scattering of low-energy photons by particles of spin ½, 9: 1399(J)

scattering of very low-frequency, by systems of spin ½, 9: 1398(J)

Lignite deposits (Idaho)

occurrence and U distribution in, 9: 2263

Lignite deposits (S. Dakota)

exploration in Mendenhall strip mine, 9: 622(R)

occurrence and U distribution in, 9: 2263

Lignites

analysis and mineralogy of U-bearing, 9: 622(R)

analysis and petrology of U-bearing, 9: 1511(R), 1827(R)

analysis, mineralogy, and petrology, 9: 3462(R)

Limestone

(See also Calcium carbonates.)

alpha radioactivity in, 9: 445(J)

coral, radiometric analysis of, for Th^{230}, 9: 1762

Limestone deposits (Wyo.)

occurrence of U mineralization in, 9: 956(J)

Line recorders

(Recording mass spectrometer; see also Mass Spectrometers.)

design of high-speed pen, and amplifier, 9: 270

Linear accelerators

(See also Cockcroft-Walton accelerators; Van de Graaff accelerators.)

beam focusing, theory, 9: 397(J)

cavity resonator analysis for proton, 9: 3987

cost factors and design of high-energy electron, 9: 772

design and operation of 50-Mev microwave, 9: 2025(J)

design of Stanford Mark III electron accelerator, 9: 3308(J)

electrical properties of helical accelerator tubes, 9: 1372(J)

electron orbits in, calculation, 9: 3660

electron traveling-wave, for radiation processing, 9: 1369(J)

fabrication of TiO_2 wave guides for, 9: 1096

focusing, 9: 2465

focusing system for 600-Mev protons, 9: 1097

phase oscillations in, analysis, 9: 3988

results from 1-Mev machine at Lyon, France, 9: 1374(J)

shunt impedance of helical accelerator tubes for, 9: 1373(J)

Linear accelerators (cont'd)

strong focusing for fast heavy particles, 9: 2024(J)

traveling-wave tube type, for medical use, 9: 1102(J)

Lipids

(See also Fatty acids; Phosphatides; Sterols.)

effects of radiation on, review of literature, 9: 2549

effects of whole-body irradiation on tissue distribution of, in liver, spleen, and kidney in rats, 9: 1161(J)

levels in blood plasma, effects of irradiation on, in rabbits, 9: 25(J)

metabolism of, in rat liver, tracer study, 9: 2099(R)

Lipoproteins

of blood serum, chromatographic analysis, 9: 3071

hydrolysis of, effects of heparin-activated enzyme systems, 9: 2540

metabolism, relationship to coronary disease, 9: 3730(R)

metabolism of, effects of radiation on, in rabbits, dogs, rats, and mice, 9: 3009

metabolism of, effects of total-body x irradiation on, in rabbits, 9: 1446

spectrophotometric determination of, in blood serum, 9: 3778

Liquid baths

design of isothermal, for use in range 200 to 500°C, 9: 4096(J)

electroforming of funnels, tubes, and trumpets of various metals from fluoborate, cyanide, sulfate–chloride, Unichrome Cr-110, and chromic acid, 9: 3495

Liquid flow

(See also Compressible flow; Convection; Gas flow; Incompressible flow; Subsonic flow; Supersonic flow; Transonic flow.)

stability of plane convective, 9: 3813(J)

Liquid jets

vibrating, with variable surface tension, theory, 9: 3444

Liquid metals

(See Metals (liquid).)

Liquid metals conferences

proceedings of, held at Abingdon, May 16, 1953, 9: 3443

summary of unclassified papers presented at meeting at General Electric Lab., October 8, 1952, 9: 4171

Liquids

degasification of, equipment, 9: 2195

gas chromatographic separation and analysis of volatile, 9: 2672(J)

nuclear magnetic resonance in, under high pressure, 9: 2011(J)

optimum free-volume theory of, 9: 235

overheated, under positive pressure, nucleation of vapor bubbles in, under ion bombardment, 9: 2663(J)

physical and physico-chemical properties of, influence on hydrodynamics, review of book, 9: 2231(J)

radioactivation apparatus using Rn^{222}, 9: 687(J)

solubility of gases in, instrument for, 9: 3068

thermal conductivity of viscous, 9: 2336(J)

thermal diffusion in, theory, 9: 2797(J)

thermal relaxation time of, nuclear inductor for measurement of, 9: 286(J)

trapping of splashes from boiling, design of apparatus for, 9: 1779

Lithium

abundance in primary cosmic rays, 9: 1299(J)

backscattering from, bombarded by 1-Mev electrons, 9: 2041(J)

chemical separation and absorptiometric determination of small amounts of, 9: 537(J)

deuteron reactions in, angular distributions, 9: 3649(J)

excitation energies of Li_2 molecule, calculation, 9: 344

heat of fusion, 9: 172

ion exchange separation from Ca and Mg and titrimetric determination of, 9: 1200(J)

Lithium (cont'd)

isotopic analysis of, by neutron activation, 9: 541(J)

π^--mesonic x-ray K lines of, 9: 671(J)

neutron-proton coincidences from γ bombardment, 9: 1066(R)

preparation of small amounts of, by electrolysis, 9: 921(J)

proton total cross sections at 208 and 315 Mev, 9: 358(J)

reaction with BF_3·NH_3, 9: 515

reactions of 125-Mev deuterons with, analysis of disintegration products from, 9: 1644

specific heat of, 9: 237(J)

thermal expansion, 77 to 300°K, 9: 727(J)

three-quantum annihilation of positrons in, 9: 249(J)

tritium production from, by deuteron bombardment, 9: 2920(J)

Lithium (liquid)

thermal conductivity, measurement, 9: 2780(J)

Lithium aluminum hydrides

reaction with dimethyl Be to form methyl Be hydride, 9: 1740

Lithium–aluminum–magnesium alloys

magnesium-rich corner of 100, 200, 375°C isothermal sections of, 9: 2760(J)

phase relations in, 9: 3166, 3481, 3484(R)

Lithium aluminum silicates

thermal fracture under quasi-static thermal stresses, 9: 1506(J)

Lithium antimonides

heat of formation of, 9: 1186(J)

Lithium borates

coloration, 9: 4314(J)

preparation of hydrided, 9: 4089(J)

Lithium borohydrides

hydrolysis, 9: 4065(J)

ion characteristics, determination of, 9: 2141(J)

reaction with B^{10}-enriched boron trifluoride etherate, 9: 3055

toxicity, 9: 4054

Lithium chloride–aluminum chloride systems

electric conductivity, 9: 2613

Lithium chloride–calcium chloride–potassium chloride systems

phase studies, 9: 4059

Lithium chloride–potassium chloride–potassium fluoborate systems (liquid)

electrolysis of, in temperature range 350 to 550°C, 9: 52

Lithium chlorides

solutions, ion exchange from, 9: 3103(J)

thermodynamic properties of $MgCl_2$ in fused, 9: 3768(J)

Lithium compounds

synthesis of organo-, 9: 4091(R)

Lithium deuterides

molecular properties and x-ray scattering, 9: 3407

Lithium fluoride crystals

color centers in x-irradiated, production and bleaching of, 9: 801(J)

color-center magnetic resonance of x-ray and proton bombarded, 9: 1119(J)

effects of neutrons on x-ray lattice parameters and density, 9: 1668(J)

fluorescence and thermoluminescence in x-irradiated, 9: 3682(J)

x-ray measurements of pile-irradiated, 9: 2947(J)

Lithium fluoride–potassium fluoride–sodium fluoride systems

thermal capacity and enthalpy, 9: 634(R)

Lithium fluorides

thermoluminescence, 9: 2412(R)

Lithium fluorides (cont'd)
unit cell dimensions of, made from Li^6 and Li^7, 9: 2374(J)
Lithium hydrides
molecular properties and x-ray scattering, 9: 3407
Lithium hydroxides
enthalpy and entropy of, to 900°K, 9: 2152(J)
heat of fusion of, at 744.3°K, 9: 2152(J)
Raman spectra of LiOH · H_2O and, at room temperature, 9: 3434
Lithium iodide crystals
gamma response, 9: 1067(R)
Lithium iodides
crystal growing and phosphor properties of activated and non-activated, 9: 3947(J)
mass spectrum, heat of dissociation, heat of sublimation, and lattice energies, 9: 2840
Lithium ions
application to particle microscopy, 9: 1950(J)
conductometric determination of, in paper chromatograms, design and performance of apparatus for, 9: 2215(J)
effect on electrodeposition of Cu, 9: 1195(J)
Lithium isotopes
decay and nuclear properties, 9: 3624(J)
mass ratios of, determined from microwave spectra of alkali halides, 9: 811(J)
Lithium isotopes Li^6
binding energy and energy levels, 9: 3635(J)
effects on unit-cell dimensions of LiF, 9: 2374(J)
energy of ground state, 9: 2442(J)
gamma reactions (γ,d) of, cross sections and nuclear properties of system, 9: 380(J)
mass difference of He^6 and, 9: 763(J)
natural abundance ratio to Li^7, 9: 1029(J)
neutron activation determination, 9: 541(J)
neutron reactions (n,t) and simple model of nucleus of, 9: 3298(J)
neutron total cross sections, 9: 1067(R)
nuclear magnetic moment of, calculated by proton-neutron coupling, 9: 742(J)
proton reactions (p,γ), 9: 3648(J)
spectrographic determination of ratio of Li^7 to, 9: 1760(J)
thermonuclear reactions of protons with, in stars, 9: 3647(J)
triton reactions(t,d) and (t,p), Q values of, 9: 763(J)
Lithium isotopes Li^7
charged particle emission from triply charged He^3 bombardment, 9: 1364(J)
deuteron reactions (d,d), 9: 1066(R)
effects on unit-cell dimensions of LiF, 9: 2374(J)
gamma reactions (γ,α) and energy levels, 9: 1095(J), 1116(J)
gamma reactions (γ,t), excitation function for, 9: 3983(J)
inelastic neutron scattering in, 9: 3320(J)
inelastic scattering of α particles from, study of 478-kev excited state by observing γ ray from, 9: 420(J)
ionization of A, CO_2, and N_2, 9: 4266(R)
natural abundance ratio to Li^6, 9: 1029(J)
nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)
proton and deuteron reactions (p,n) and (d,n), 9: 1067(R)
proton reactions (p,n), resonances in, 9: 765(J)
proton reactions (p,n), studied by time-of-flight techniques, 9: 376
spectrographic determination of ratio of Li^6 to, 9: 1760
thermonuclear reactions of protons with, in stars, 9: 3647(J)
Lithium isotopes Li^7 (cont'd)
triton reactions (t,α), angular distribution of, 9: 385(J)
triton reactions (t,α), Q value of, 9: 763(J)
Lithium isotopes Li^8
decay and half lives, 9: 1680(J)
half life, 9: 2951
range-energy relations, 9: 408(J)
Lithium–magnesium alloys
constitution diagram of, 9: 2768(J)
mechanical properties, rolling, and structure, 9: 4160(R)
thermodynamic properties, 9: 2294(R)
Lithium–magnesium–silver alloys
constitution diagram of, 9: 2768(J)
Lithium–magnesium–zinc alloys
phase relations in, 9: 3166
Lithium oxide–boron oxide–silicon oxide systems
thermal expansion, 9: 1555
Lithium oxide–boron oxide–water systems
phase studies, 9: 4073(J)
Lithium oxides
enthalpy and entropy of, to 1050°K, 9: 2152(J)
volatility at high temperatures, experimental investigation, 9: 2156(J)
Lithium–silver alloys
constitution diagrams, casting, and crystal structure, 9: 2767(J)
Lithium–sodium alloys (liquid)
activity coefficients and phase studies, 9: 172
LITR
(See Materials Testing Reactor Mockup.)
Litters
relationship between, and survival following mid-lethal irradiation in mice, 9: 39(J)
Little Doe Claim (Ariz.)
exploration of, 9: 161
Liver
accumulation of β activity from injected P^{32} in, effects of dose size on, 9: 1717(J)
blood flow in, effects of adrenaline, diet, and leukemia on, tracer study, 9: 2609
concentrations of oxidized and reduced diphosphopyridine nucleotide in, effects of total-body x irradiation on, in rats, 9: 3740(J)
effects of γ radiation on, of white rats, 9: 834(J)
enzyme systems, effects of total-body x irradiation on, in rats, 9: 2120(J)
function test, employing radioactive Rose Bengal, 9: 1462
mass, effects of total-body x irradiation on, in rats, 9: 1447
radioinduced cirrhosis, changes in electrophoretic patterns in plasma and ascitic fluid associated with, in dogs, 9: 829(J)
Liver diseases
cirrhosis, effects of low-protein diet on development of, in irradiated rats, 9: 2569(J)
effects of, on uptake of I^{131} by thyroid, 9: 499(J)
radiodiagnosis, 9: 1462
Lodgepole Area (S. Dak.)
uranium distribution in, 9: 2263
Long Area (Alaska)
uranium distribution in, 9: 1523(J)
Long John Claim (Colo.)
uranium and V distribution, 9: 1513
Los Alamos Scientific Lab.
radiation monitoring handbook, 9: 3928

Los Alamos Water Boiler

recombination of H_2 and O_2 from, 9: 754(J)

Lovelace Foundation for Medical Education and Research, Albuquerque, N. Mex.

progress reports, 9: 3359, 3360

Low Intensity Training Reactor

(See Materials Testing Reactor Mockup.)

progress reports on frictional properties of Ti and its alloys, 9: 961(R), 3487(R)

Lubricants

(See also Greases.)

bibliography on, 9: 1817

corrosive effects, oxidation, and properties of, 9: 2795(R), 3123(R)

development of gear and spline lubricant tester, 9: 1817

effectiveness of, for Hf, Zr, and Ti, 9: 961(R)

high-temperature, development and properties, 9: 4120(R)

high-temperature, thermal decomposition, 9: 3805(R)

mist cooling in machine tool practice, health hazards, 9: 2723

oxidation by, effects of antioxidant additives, 9: 4115(R)

stability, volatility, and viscosity at high temperatures, 9: 1814(R)

synthesis, thermal decomposition, and properties of high-temperature, 9: 517(R)

temperature limitation of, for ball bearings, 9: 1813

thermal properties, 9: 4108(R)

thermal properties and corrosive effects, 9: 136(R)

Lucky Strike No. 2 Mine (Utah)

occurrence of rabbittites in, 9: 3829(J)

Lukachukai District (Ariz.)

exploration and geology, 9: 2262(R)

geology, 9: 1828

mineralogy, 9: 1829

Luminescence

(See also Fluorescence; Phosphorescence.)

in organic phosphors, 9: 864(J)

symposium on solid inorganic phosphors, 9: 1614(J)

theory of electro-, 9: 2343(J)

Luminescent detectors

design, 9: 4248(J)

design of "luminescence chamber", 9: 2860(J)

performance, 9: 2412(R)

thermo-, design and performance, 9: 1964(R)

Luminescent materials

abstracts of literature on, 9: 3225(J)

symposium on solid inorganic phosphors, 9: 1614(J)

Lungs

deposition and retention of α-emitting aerosols, 9: 4048

deposition of aerosols in, of dogs, 9: 3359

Lutetium

arc spectrum, analysis, 9: 4024(J)

tissue distribution of, in experimental animals, tracer study, 9: 1725(J)

Lutetium chlorides

crystal structure, 9: 544(J)

Lutetium isotopes Lu^{175}

energy levels, 9: 4274(J)

Lutetium isotopes Lu^{177}

beta emission, 9: 2058(J)

Lymphocytes

abnormal, incidence following exposure to ionizing radiation in rats and mice, 9: 1710

Lymphocytes (cont'd)

internal conversion, 9: 1994(R)

M

Magnesium

absorptiometric determination of, in Ti and Ti alloys, 9: 1198(J)

backscattering from bombarded by 1- and 2-Mev electrons, 9: 2041(J)

chromatographic determination of, in mixtures of Na, K, Mg, and Ca, 9: 3400(J)

combustion in air and O_2 and thermal capacity, 9: 3498(R)

corrosion and polarization in $NaCl-Na_2CrO_4$ solutions and anodized coatings on, 9: 3870

corrosion by hydraulic fluids, 9: 2795(R)

corrosion testing, methods for cleaning exposed specimens for, 9: 952(J)

detection of, on Al by colorimetric spot tests, 9: 1196

electron emission from, bombarded by hydrogen ions, 9: 250(J)

electroplating on, procedure, 9: 3881(J)

gamma reactions, N^{17} yield curve from, 9: 3644

ion exchange separation and titrimetric determination of Li, K, and Na in presence of, 9: 1200(J)

natural and synthetic anodic films on, 9: 3852(R)

oxidation of, under conditions of linear temperature increase, 9: 182

photonuclear reactions, 9: 2449(J)

protective effects of, against radiation injuries, in Hydra, 9: 41(J)

proton reactions (p,n), angular distributions and yields at 23 Mev, 9: 4290(J)

scattering cross sections for deuterons at 4.0 to 7.8 Mev and protons at 3.0 to 6.5 Mev, 9: 2944(J)

twinning and untwinning in, 9: 2771(J)

welding of, survey and bibliography, 9: 1851(R)

Magnesium (liquid)

explosions with water, prevention of, 9: 1743

Magnesium alloys

analysis for B and effects of B on mechanical properties, 9: 3480

corrosion testing, methods for cleaning exposed specimens for, 9: 952(J)

effects of temperature and unstable microstructure on mechanical properties, 9: 3510

natural and synthetic anodic films on, 9: 3852(R)

preparation, analysis, corrosion, and mechanical properties, effects of alloying elements on, 9: 3871

tensile and creep properties and electric conductivity at room and elevated temperatures of sand-cast and sand-extruded, containing Th, rare earths, and Zr, 9: 1852(R)

with thorium, rare earths, and Zr, room- and elevated-temperature mechanical properties and heat treatment, 9: 3840(R)

welding of, survey and bibliography, 9: 1851(R)

Magnesium–aluminum alloys

chemical analysis and creep resistance, 9: 4161(R)

compression strength properties, 9: 3865(R)

creep of, effects of structure on, at high temperature, 9: 2732

creep of, grain-boundary movement, slip, and fragmentation during, 9: 2321(J)

effects of temperature and grain size on flow and fracture strengths of a solid solutions of, 9: 3172(R)

electrolytic polishing, 9: 4189(J)

foaming in crucibles, effects of ZrH_4 additions on, 9: 191

formation of foamed metal low-density core material of, for sandwich construction, design of equipment for, 9: 3182

formation of low-density foams of, methods and equipment for, 9: 3181

interaction of precipitation, solid-solution content, and creep in, 9: 1270

intercrystalline corrosion, due to aging, 9: 4143(J)

sand casting of, development of inhibitors, review, 9: 3476

Magnesium–aluminum alloys (cont'd)

soft x-ray spectra, 9: 3697(J)

weld crack sensitivity in, effects of separation stresses, form of separation of intermediate phases, shrinkage cavities, and unusual shrinking stresses on, 9: 196

Magnesium–aluminum–copper alloys

aging characteristics, 9: 2323(J)

Magnesium–aluminum–copper–manganese alloys

effects of heat treatment on corrosion, 9: 4143(J)

exaggerated grain growth of extruded, 9: 1545(J)

Magnesium–aluminum–lithium alloys

magnesium-rich corner of 100, 200, 375°C isothermal sections of, 9: 2760(J)

phase relations in, 9: 3166, 3481, 3484(R)

Magnesium–aluminum–manganese alloys

weld crack sensitivity in, effects of separation stresses, form of separation of intermediate phases, shrinkage cavities, and unusual shrinking stresses on, 9: 196

Magnesium–aluminum–silicon systems

electrolytic polishing, 9: 4189(J)

Magnesium–aluminum–zinc alloys

stress corrosion of, due to $MgZn_2$, 9: 4143(J)

Magnesium–beryllium alloys

alloying effect of Be on properties of, 9: 982(J)

Magnesium–cadmium compounds (intermetallic)

ordering in, 9: 637

thermodynamic properties, 9: 2735(R)

Magnesium–calcium alloys

mechanical properties, rolling, and structure, 9: 4160(R)

Magnesium–cerium alloys

creep behavior and microstructure, 9: 192

grain boundaries, microscopy, 9: 4161(R)

Magnesium–cesium compounds (intermetallic)

crystal structure, 9: 683(J)

Magnesium chelates

with 2,4-pentanedione, formation constants, enthalpy, and entropy, 9: 3390(J)

Magnesium chlorides

dehydration with liquid NH_3, 9: 64

thermodynamic properties in fused alkali metal chlorides, 9: 3768(J)

Magnesium crystals

effects of temperature and grain size on flow and fracture strengths of, 9: 3172(R)

Magnesium fluorides

thermal conductivity and thermal diffusion, 9: 1283

Magnesium hydrides

preparation by the reaction of H on Mg metal and properties of, 9: 848

Magnesium ions

activity measurements with resin membrane electrodes, 9: 2149(J)

equilibrium formation constants for reaction in aqueous solution of acetylacetonate ion with, 9: 1752(J)

Magnesium isotopes Mg^{23}

beta emission, 9: 1121

Magnesium isotopes Mg^{24}

deuteron reactions (d,d), 9: 1066(R)

energy levels, 9: 1359(J)

gamma reactions (γ,n) and (γ,p), cross sections, 9: 3301(J)

gamma reactions (γ,p) and (γ,n), yield ratios, 9: 3300(J)

neutron reactions (n,p), 9: 798(J)

Magnesium isotopes Mg^{25}

activation determination with α source, 9: 1650(J)

Magnesium isotopes Mg^{25} (cont'd)

nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)

proton reactions (p,γ), 9: 3302(J), 3303(J)

proton reactions (p,γ), resonances and comparison of positron–γ yields, 9: 2453(J)

proton reactions (p,n), 9: 1067(R)

proton reactions (p,2p), (p,α), and (p,2α), excitation functions for, compared to N^{14}-induced reactions in C^{12}, 9: 1649(J)

Magnesium isotopes Mg^{26}

proton reaction (p,n), 9: 1067(R)

Magnesium–lanthanum compounds (intermetallic)

crystal structure, 9: 683(J)

Magnesium–lead alloys

corrosion properties and electrode potentials of, in various media, 9: 4143(J)

Magnesium–lithium alloys

constitution diagram of, 9: 2768(J)

mechanical properties, rolling, and structure, 9: 4160(R)

thermodynamic properties, 9: 2294(R)

Magnesium–lithium–silver alloys

constitution diagram of, 9: 2768(J)

Magnesium–lithium–zinc alloys

phase relations in, 9: 3166

Magnesium–manganese–rare earth alloys

preparation, annealing, and electron-diffraction analyses, 9: 4160(R)

Magnesium nitrides

vaporization, 9: 2627(J)

Magnesium oxide–calcium oxide systems

magnetic susceptibility of, at elevated temperatures, 9: 996(J)

Magnesium oxide crystals

electrical conductivity induced in, by electron bombardment, 9: 3989

Magnesium oxide films

electric conductivity and microstructure, 9: 3870

Magnesium oxide–titanium systems

powder metallurgy, 9: 3496

Magnesium oxide–uranium oxide systems

oxidation of, phase diagrams, 9: 1796(J)

phase studies, 9: 925

Magnesium oxides

dielectric properties and solid-state reactions of, with binary, ternary, and quaternary systems of CaO, SnO_2, and TiO_2, 9: 3820(J)

reaction of Th with, at high temperatures, 9: 1247

Magnesium powders

production equipment, operating procedures, sampling, and packaging, description of, 9: 2278

production methods and equipment, particle size measurement, and explosive limits, 9: 2277

Magnesium–rare earth alloys

preparation, annealing, and electron-diffraction analyses, 9: 4160(R)

Magnesium–rare earth–zirconium alloys

preparation, annealing, and electron-diffraction analyses, 9: 4160(R)

Magnesium silicides

electric properties, 9: 4266(R)

Magnesium–silicon systems

soft x-ray spectra, 9: 3697(J)

Magnesium–strontium compounds (intermetallic)

crystal structure, 9: 683(J)

Magnesium–thorium alloys
determination of solubility of Th in Mg at 1050°F, 9: 4161(R)
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)
Magnesium–thorium alloys (liquid)
electromagnetic pump and heating transformer for, design, 9: 931
Magnesium–thorium–zirconium alloys
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)
Magnesium–tin alloys
corrosion of, in 95°C, low-conductivity, aerated, distilled water, 9: 2725
Magnesium titanates
crystal structure, 9: 3844(R)
Magnesium–titanium alloys
constitution diagrams, 9: 2761(J)
heat treatment, 9: 3486(R)
Magnesium uranates
crystal structure, 9: 2226(J)
Magnesium–uranium(IV) fluoride systems
thermal conductivity and thermal diffusion, 9: 1283
Magnesium–zirconium alloys
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)
tungsten-argon arc welding of, 9: 2737
Magnet coils
design for cloud chambers, 9: 2862(J)
Magnetic fields
(See also Electromagnetic fields.)
behavior of an ionized gas in, 9: 1941(J)
effect on Cherenkov radiation of particle traversing, 9: 2043(J)
emission of photons and electron-positron pairs in, 9: 414(J)
high-order focusing of charged particles by, 9: 2804(J)
measurement and testing of, of Bevatron, 9: 3663
measurement of, using proton magnetic resonance, 9: 3916(J)
measurement with Bi wires, 9: 3577
measuring instrument for, 9: 276(J)
particle orbits in, in alternating gradient channel using permanent bar magnets, 9: 395
Magnetic resonance
(See also Nuclear magnetic resonance.)
absorption spectra in Ce, Nd, and Pr, 9: 2075(J)
absorption theory, 9: 1628(J)
absorption theory, stochastic, 9: 1629(J)
in rare earth metals, theory, 9: 2074(J)
recording high-sensitivity paramagnetic resonance spectrometer, 9: 2391(J)
Magnetism
measurement at liquid He temperatures, 9: 4209
Magnetometers
design, 9: 4039(R)
Magnets
design and analysis of, for CERN synchrotron, 9: 388
design and properties for CERN synchrotron, 9: 1652
design for CERN synchrotron, 9: 1367
effective permeability of laminated, under dynamic conditions, 9: 389
electro, for measuring magnetic susceptibility, design, 9: 512
of high-energy proton synchrotrons, power supply for, 9: 1098
Maize
radioinduced endosperm mutations in, 9: 28(J)
Majuba Hill Mine (Nev.)
uranium distribution, 9: 1260(J)
Mallory, P.R. and Co., Inc.
progress reports on manufacture of Ti alloys, 9: 1267(R), 2717(R)
Malonic acid
decarboxylation of, at 140.5°, intramolecular isotope effects of C^{14} and C^{13} in, 9: 871(J)
Mammals
(See also specific mammals.)
adaptation of, to ionizing radiation, review, 9: 4043
cells and tissues, radiosensitivity, factors affecting, 9: 3015(J)
immediate and late effects of total-body exposure to radiation on, review, 9: 3368(J)
relative biological effectiveness of various radiations in mice, rats, rabbits, and men, 9: 3007
Man
natural radioactivity in, determination of, using a differential high-pressure ionization chamber, 9: 444(J)
Mandelic acid
analytical use of, for determination of Th, 9: 2643(J)
Manganese
activation determination in biological materials, 9: 4205(R)
adsorption and distribution of, effects of complexing agents on, tracer study, 9: 2099(R)
colorimetric determination of, by oxidation with bromate in sulfuric acid medium, 9: 2637(J)
compressibility parameters and Grüneisen's constants, 9: 1863
curved-crystal x-ray spectrometric microdetermination of, in Al alloys, 9: 3435(J)
determination in U by ion exchange, 9: 884(J), 1793(J)
determination of, in high-temperature alloys using anion-exchange separations, 9: 1544(J)
determination of Th in ocean sediments of, 9: 3819(J)
electroforming from chloride and chloride–sulfate baths, 9: 3495
mechanical properties and microstructure of flash-welded, 9: 964
neutron transmission and resonances, 9: 988(R)
proton stopping cross section, 9: 2026
quantitative determination of divalent, using a high-frequency oscillator and ethylenediaminetetraacetic acid, 9: 2169(J)
reaction with fused NaOH, 9: 1466(J)
separation from solutions containing cations, 9: 2331(R)
spectrographic determination in Bi, 9: 1475
spectrographic determination of, in ores and rocks, 9: 162
x-ray spectra (soft), 9: 452(J)
Manganese alloys
casting and forging for gas turbine application, 9: 3869
room- and elevated-temperature mechanical properties and heat treatment, 9: 3840(R)
Manganese–aluminum–chromium compounds (intermetallic)
crystal structure, 9: 2373(J)
Manganese–aluminum–copper–magnesium alloys
effects of heat treatment on corrosion, 9: 4143(J)
exaggerated grain growth of extruded, 9: 1545(J)
Manganese–aluminum–magnesium alloys
weld crack sensitivity in, effects of separation stresses, form of separation of intermediate phases, shrinkage cavities, and unusual shrinking stresses on, 9: 196
Manganese–aluminum–titanium alloys
analysis of, for H, 9: 3077(J)
casting and mechanical properties of as-cast and wrought, 9: 184
compression properties and microstructure, 9: 3475
fabrication, heat treatment, phase studies, mechanical properties, microstructure, and aging characteristics, 9: 1856
hardness, crystal structure, and phase studies, 9: 3520
high-temperature tensile properties of annealed sheet and bar, 9: 3198(J)
machining and grinding, 9: 4174

Manganese–aluminum–titanium alloys (cont'd)
phase studies and microstructure, 9: 1873(J)
transformation temperatures, age hardening, heat treatments, and mechanical properties, 9: 1534
Manganese antimonides
magnetic properties, 9: 1067(R)
Manganese–bismuth alloys
large magnetic Kerr rotation in, 9: 1540
Manganese–carbon–titanium systems
fabrication, heat treatment, phase studies, mechanical properties, microstructure, and aging characteristics, 9: 1856
heat treatment, mechanical properties, microstructure, and phase studies, 9: 180(R)
phase studies and microstructure, 9: 1873(J)
Manganese chelates
with 2,4-pentanedione, formation constants, enthalpy, and entropy, 9: 3390(J)
Manganese chlorides
specific heat and magnetic properties at low temperature, 9: 1067(R)
Manganese–chromium–iron–molybdenum–titanium alloys
mechanical properties and microstructure of extruded and heat treated, effects of temperature, pressure, and die angle on, 9: 2276(R)
Manganese–chromium–iron–molybdenum–titanium–vanadium alloys
heat treatment, mechanical properties, phase studies, tensile properties, and welding, 9: 2298
tensile properties, hardness, and flash weldability, 9: 3856
Manganese–chromium–molybdenum–titanium alloys
microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296
Manganese–chromium–titanium alloys
grain structure, hardness, heat treatment, mechanical properties, phase studies, and welding, 9: 2298
Manganese–cobalt–molybdenum alloys
oxidation at 940°C, 9: 3146
Manganese complexes
with 2, 2'-bipyridine and 1,10-phenanthroline, chemical properties, 9: 512
Manganese(II) fluorides
crystal structure, 9: 92(J)
Manganese hydrides
preparation of, by reaction with atomic H, 9: 635(R)
Manganese ions
equilibrium formation constants for reaction in aqueous solution of acetylacetonate ion with, 9: 1752(J)
separation by ion exchange, 9: 910(J)
Manganese isotopes Mn^{52}
half lives, 9: 1066(R), 2971(J)
Manganese isotopes Mn^{54}
half life, 9: 2971(J)
nuclear orientation at low temperatures and γ radiation from, 9: 747(J)
polarization of γ rays emitted by oriented, 9: 748(J)
Manganese isotopes Mn^{55}
Coulomb excitation functions and energy levels for, bombarded with 3.5-Mev α particles, 9: 423(J)
energy levels, 9: 3319(J)
inelastic neutron scattering in, 9: 3319(J)
Manganese–magnesium–rare earth alloys
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)
Manganese–mercury alloys
phase studies and crystal structure, 9: 3204(J)
Manganese–molybdenum–nickel alloys
oxidation at 940°C, 9: 3146
Manganese–nickel alloys
brittle failure of brazing wire containing 60% Mn, causes and prevention, 9: 4169
neutron-diffraction studies of magnetic structure of, 9: 2312(J)
Manganese–nickel–uranium alloys
pseudo-binary phase sections between Laves phases in, 9: 3353(J)
Manganese–nitrogen–titanium systems
fabrication, heat treatment, phase studies, mechanical properties, microstructure, and aging characteristics, 9: 1856
phase studies and microstructure, 9: 1873(J)
Manganese oxides
heat and free energy of formation, 9: 529(J)
Manganese–oxygen–tantalum systems
metallic ternary phases in, 9: 3185(J)
Manganese–titanium alloys
analysis of, for H, 9: 3077(J)
casting and mechanical properties of as-cast and wrought, 9: 184
creep of as-received and heat-treated, at 76, 210, 400, and 600°F, aging effects on, 9: 3479(R)
creep of heat-treated and as-received, at 76, 210, 400, and 600°F, 9: 3478(R)
creep of RC 130A, 9: 168(R)
electric resistance, microstructure, phase studies and impact and tensile properties of heat-treated, 9: 974
fabrication and mechanical properties, 9: 3858
hardness, heat treatment, and microstructure, 9: 4186
hardness and microstructures of welded RC-130A, 9: 3493(R)
heat treatment response, effect of α solutes on, 9: 1873(J)
high-temperature tensile properties of annealed sheet and bar, 9: 3198(J)
machining and grinding, 9: 4174
mechanical properties, effect of H on, 9: 1857(R)
microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296
phase studies, bend ductility, and tensile strength of welded and unwelded RC-130A, 9: 3493(R)
phase studies and physical properties, 9: 1528
spot welded joints in, 9: 1839(R)
tensile properties, 9: 1848(R)
welding of RC-130A, effect of heat treatment and surface contamination on, 9: 227(J)
Manley Hot Springs District (Alaska)
uranium distribution in, 9: 1523(J)
Marie and Mary Claim (S. Dak.)
uranium and Th distribution, 9: 165(J)
Marysvale Area (Utah)
mineralogy, 9: 1829
Mass spectrography
(See also appropriate subheadings under specific materials.)
atomic mass difference determination by, 9: 730(J)
bibliographies, 9: 4236
capillary leaks for continuous sampling of gas streams, 9: 2841(J)
continuous sampling of gas streams for analyses by, capillary leaks for, 9: 2841(J)
procedures for U and Pu analysis in ANL manual, 9: 4074
Mass spectrometers
(See also Calutrons; Electromagnetic separation; Ion sources; Line recorders.)
bibliography on, 9: 1961
calibration of, using standard samples of H_2-T_2, 9: 3248
design of, for instantaneous analysis of gas mixtures, 9: 1578 (R), 1579(R)

Mass spectrometers (cont'd)
design of magnetic time-of-flight, 9: 1444(P)
design of panoramic, for chemical kinetic studies, 9: 2407
for determination of low concentrations of deuterium in hydrogen, design, 9: 3920
improved ion source for, for analysis of solids, 9: 1595(J)
ion source electron current and energy regulator for, 9: 1031(J)
magnetometer for, for mass indication and spectra calibration in mass range 2 to 400, 9: 276(J)
peak-height comparison method for, 9: 1314(J)
for resolution of cosmic ray particles, 9: 1918(J)
r-f, for the instantaneous analysis of gas mixtures, design, 9: 3918(R), 3919(R)
resolving power, increasing with heterogeneous magnetic field, 9: 2843(J)
trap-current controlled emission regulator for ion source for, 9: 2408
utilizing crossed electric and magnetic fields, proposed design, 9: 4246

Mass transfer
(See also appropriate subheadings under specific materials, processes and devices involved.)
analogy between heat transfer and, in turbulent flow, 9: 4132
effect of, on corrosion of Ni by molten NaOH, 9: 951(J)
inhibition of, in stainless steel–liquid Na systems, 9: 4175(R)
in irradiated stainless steel loops circulating liquid Na, measurement, 9: 4179(R)
review, 9: 3222(J)
in stainless steel loops, effect of area on, 9: 4179(R)

Massachusetts Inst. of Tech.
progress reports, 9: 3111(R)
progress reports on adaptation of new research techniques to mineral engineering problems, 9: 623(R)
progress reports on creep structure characteristics of Ti and its alloys, 9: 175(R)
progress reports on fundamentals of cold working and recrystallization, 9: 973(R), 2295(R)
progress reports on isotopic abundances of Sr, Ca, and A and related topics, 9: 4234(R)
progress reports on mechanical properties of sintered Al powder, 9: 4166(R)
progress reports on metal-ceramic interactions at elevated temperatures, 9: 653(R), 2702(R)
progress reports on metallurgy, 9: 2727(R)
progress reports on solid solutions and grain boundaries, 9: 972(R), 2294(R)
progress reports on thermal conductivity of refractory materials, 9: 946(R), 2793(R)
progress reports on thermodynamics of metal solutions, 9: 3177(R)
progress reports on vapor-deposited coatings, 9: 4162(R)

Materials of construction
(See Building materials.)

Materials testing
(See also the specific material or equipment concerned or properties being tested; see also specific testing procedures, e.g., Sonic inspection; see also Mechanics; Metallurgy.)
bibliography of ultrasonic nondestructive testing, 9: 2237
criterion for minimum scatter in fatigue testing, 9: 1816
eddy current bond thickness measurement, 9: 167(R)
equipment for testing relaxation of Ti, 9: 3505(R)
evaluation of xeroradiography for, 9: 3816
gas seal for high-temperature tensile tests in inert atmospheres, 9: 1498(J)
life test estimation procedures, 9: 3814
method for creep and stress-rupture tests, 9: 1251
of spherical shape by thermal shock, 9: 1497(J)

Materials testing (cont'd)
techniques for failure testing of manufactured units, 9: 942
by thermal shock failure, 9: 1496(J)

Materials Testing Reactor
radiation dosages from γ irradiation facility, 9: 3050
shielding, efficiency, 9: 2446
temperature distributions in structure outside the reactor tank, 9: 759(J)

Materials Testing Reactor Mockup
equipment for disassembling in-pile circulating loop, 9: 752(J)

Mathematical tables
of statistical functions, 9: 1033(J)
of two-center Coulomb integrals between 1s, 2s, and 2p orbitals, 9: 4239

Mathematics
(See also Biometry; Computers; Constants and conversion factors; Statistics.)
application to chemistry and chemical engineering, review, 9: 3249(J)
curve fitting a Gaussian function by least-squares method, 9: 2411
of differential systems with interface conditions, 9: 4240
generalized spin representation, 9: 1416
status of studies by Mathematics Panel at ORNL, 9: 2845(R)
tables of electron scattering solutions by a point charge, 9: 1139
Tamm-Dancoff method in configuration space, 9: 2531

Mauch Chunk Area (Penna.)
geology of, 9: 164(J)

Mayoworth Area (Wyo.)
exploration, geology, stratigraphy, and U distribution, 9: 956(J)

Mechanics
(See also specific geometric shapes, e.g., Cylinders; Spheres; see also Materials testing; Quantum mechanics; Stress analysis; Structures.)
linear elastic structures, response to dynamic loading and shock motion, 9: 3894

Melrose District (Mont.)
exploration for U and Th deposits in, 9: 1520(J)

Melting
(See also appropriate subheadings under specific materials, see also Furnaces.)
design and performance of apparatuses for resistance and induction zone, 9: 1855(R)
equipment for, design and performance of, for preparation of Ti-base alloy, 9: 1850(R)
technique of high-vacuum, 9: 195(J)

Membranes
(See also Films.)
preparation, moisture content, capacity, thickness, and potential measurements of ion-exchange, of polystyrenesulfonic acid type, 9: 1753(J)
separation of gaseous mixtures by diffusion through, 9: 685(J)

Memory devices
bibliography on data storage and recording, 9: 3207
magnetic drum, for electronic computers, survey, 9: 1018

Mendenhall Strip Mine (S. Dak.)
stratigraphy of U-bearing lignites in, 9: 622(R)

Mercaptans
(See Thiols.)

Mercapto group
in coenzyme A, radiosensitivity, 9: 2574(J)
determination of, in tissues from rats, 9: 18
effects of p-chloromercuribenzoate on radiation injuries to yeasts, 9: 1712

Mercury

absorption of cosmic μ mesons, 9: 721

effect of wetting on heat transfer characteristics of, 9: 1807(R)

elastic scattering of high-energy electrons by, 9: 3321(J)

detection of, on Al by colorimetric spot tests, 9: 1196

hyperfine structure of, extracted from neutron-irradiated gold, 9: 2524(J)

μ-meson capture by, transition probability for, in terms of dielectric charge distribution, 9: 1068(J)

neutron diffraction study, 9: 412(J)

photoneutron yield, measurement with NaI crystal, 9: 3944(J)

scattering of 0.32 mc^2 γ rays in, calculation, 9: 2480(J)

secondary electron production from, by Hg ions, 9: 1562(J)

solvent extraction from Tl(III), 9: 1066(R)

spectrographic determination of, in ores and rocks, 9: 162

suitability as a standard wavelength source extracted from neutron-irradiated gold, 9: 2524(J)

thermal conductivity coefficients from 150 to 540°C, measurement, 9: 3895

velocity of outflow of, into mercuric nitrate solutions of various concentrations, 9: 3766

wetting of Tl with, 9: 2766(J)

Mercury cathodes

isotopic separation of H_2 at, 9: 71(J)

Mercury compounds

diuretics containing, effects on mortality of irradiated rats, 9: 2548(R)

Mercury delay lines

application to memory circuit of digital computers, 9: 2410

Mercury electrodes

potential of Ag, AgCl and Hg, HgCl combination in HCl, 9: 2623(J)

Mercury ions

secondary electron production from Hg targets by, 9: 1562(J)

Mercury isotopes

determination of Hg^{202} in Hg by resonance absorption, 9: 532

optical studies of radioactive, 9: 1670(J)

Mercury isotopes Hg^{195}

decay scheme, 9: 1409(J)

Mercury isotopes Hg^{198}

angular distribution of resonance fluorescence radiation from 411-kev excited state of, 9: 3685(J)

Mercury isotopes Hg^{199}

neutron inelastic scattering, 9: 4204(R)

Mercury isotopes Hg^{202}

determination in Hg by resonance absorption, 9: 532

spin and lifetime of 439-kev excited state, 9: 4284(J)

Mercury isotopes Hg^{203}

decay scheme, 9: 2957(J)

Mercury–manganese alloys

phase studies and crystal structure, 9: 3204(J)

Mercury nitrates

poisoning of amylase with, 9: 3766

stress-corrosion testing in $HgNO_3$ solutions of Si bronze cyclotherm-type auxiliary boiler for nonmagnetic minesweepers, 9: 3169

Mercury(II) nitrates

velocity of outflow of Hg into solutions of, 9: 3766

Mercury oxides

heat and free energy of formation, 9: 529(J)

Mesaverde Formation (Ariz.)

geology, 9: 1828

Mesic atoms

energies of K transitions of π-mesonic x rays from, 9: 1909(J)

energy level displacement in, 9: 740(J)

excitation of nuclear rotational states in μ, 9: 2902(J)

nuclear fine structure in μ-mesic atoms, 9: 1634(J)

polarization shift of levels in, nuclear volume effect, 9: 2884(J)

vacuum polarization in, 9: 993(J)

x-ray K lines of π mesic atoms, 9: 671(J)

Mesityl oxide

extraction of Po, Bi, and Th with, 9: 2674(J)

Meson beams

negative μ, production and radio-chemical analysis of π^-/μ^- ratio, 9: 1057(J)

Meson decay

equipment for time measurement, 9: 303

neutral π, energy of showers from, 9: 2360

Mesons

(See also Cosmic mesons, K particles; S particles; V particles.)

absorption of fast charged hyperons by nucleons, 9: 3611(J)

associated production of a positively charged meson and a hyperon, 9: 2881(J)

cloud chamber evidence for a charged counterpart of the θ^0 particle, 9: 1058(J)

collision of high energy, with nuclei, 9: 1667(J)

decay of, angular correlation effects in, 9: 1988(J)

decay of, into three particles, energy spectrum of secondary particles, 9: 333(J)

decay of heavy, into 5 particles, 9: 1059(J)

decay of hyperon in flight with formation of σ star, 9: 1624(J)

detection in nuclear emulsions exposed to betatron proton beam and targets, 9: 2890(R)

double-star event in nuclear emulsion, 9: 3615(J)

energy relations in nuclear emulsions, tables of, 9: 1557(J)

gamma decay lifetime of neutral, 9: 1621(J)

gamma radiation from decay of, detection, 9: 2099(R)

heavy, formation in high-energy collisions, 9: 2880(J)

heavy, summary of evidence on, 9: 2433

heavy review in Annual Review of Nuclear Science, 9: 3957(J)

heavy unstable, detection by counter selection system and cloud chamber, 9: 3955(J)

high-energy pair production events at high altitude, 9: 1625(J)

hyperon decay and interaction events in nuclear emulsions, 9: 3614(J)

identification of new hyperon (Y_1^-), 9: 339(J)

interaction at rest of charged hyperon stopped in nuclear emulsion, 9: 3566(J)

interaction coupling theory with nucleons, 9: 1630(J)

interaction of, with nucleons, S matrix for, 9: 335(J)

interaction of mesons with, saturation of nuclear force by, 9: 337(J)

interaction with nucleons, theory, 9: 330(J)

ionization energy loss of, in NaI scintillation crystal, 9: 708(J)

K-mesonic decay of a slow secondary particle in cosmic radiation, 9: 3236(J)

lifetime of heavy, measurements and method for measuring, 9: 3956(J)

mass difference theory, 9: 1078(J)

mass of heavy unstable, 9: 3271

meson-nucleon scattering, S matrix expressed in Heisenberg representation for, 9: 3704(J)

models for the description of hyperon structure and interactions, 9: 3613(J)

multiple production, theory, 9: 3604(J), 4026, 4027(J)

Mesons (cont'd)

multiple production of, charge and isotopic-spin conservation, 9: 3269(J)

observation of delayed decay of neutral or charged hyperon, 9: 1005(J)

phenomenological study of Λ, and Λ nuclei, 9: 3612(J)

production by nucleon-proton collisions, 9: 1069(J)

production by peripheral nucleon collision, theory, 9: 1338(J)

production of photo-, by meson-nucleon scattering, 9: 2044(J)

renormalization of a neutral vector meson interaction with fermions, 9: 1694(J)

scattering by nucleons, fourth-order corrections to, in pseudoscalar meson theory, 9: 1662(J)

scattering by nucleons and photomeson production, 9: 2044(J)

stopping and mass of heavy, 9: 1335(J)

stopping of heavy negative, in nuclear emulsions, 9: 328(J)

systematization of heavy, and hyperons, 9: 1623(J)

theory of pseudoscalar coupling, 9: 1144(J)

unstable, mean-life determinations of, from cosmic radiation, 9: 1009(J)

unstable heavy, probability of decay in flight in photographic emulsion exposed at high altitudes, 9: 1294(J)

Mesons (θ)

formation and decay scheme, 9: 3961(J)

production from π^--p scattering, 9: 1666(J)

Mesons (θ^0)

decay, angular distribution between π^+ and π^- mesons in, 9: 4259(J)

decay, charge conjugation in, 9: 3702(J)

mean lifetime estimate, 9: 3608(J)

decay and spin, 9: 3273(J)

Mesons (κ)

capture of negative, 9: 4262(J)

decay, 9: 3961(J)

nuclear interactions, 9: 3960(J)

Mesons (Λ)

production from π^--p scattering, 9: 1666(J)

Mesons (Λ^0)

decay, 9: 1335(J)

decay and excited states, 9: 1622(J)

production in pion-nucleon or nucleon-nucleon interactions, 9: 1986(J)

Mesons (μ)

absorption of cosmic, in Sb, Sn, Cu, Cd, Pb, Hg, Mo, and Ag, 9: 721

capture of, transition probability for, in terms of electric charge distributions, 9: 1068(J)

decay, radiative corrections to, 9: 2435(J)

electromagnetic interactions with electrons, 9: 2882(J)

excess of positive over negative, at high energy, 9: 1060(J)

interactions of fast, in production of penetrating secondaries, 9: 326(J)

ionization energy losses of fast, at high gas pressures, correlation with Landau distribution, 9: 2489

ionization of gases by, 9: 3959(J)

large angle scattering of, in Fe, 9: 3322(J)

meson decay life of positive and negative, 9: 2436(J)

positron spectrum from decay of, 9: 2890(R)

production of pairs in Be and Al by 345-Mev bremsstrahlung, 9: 1336(J)

production spectra in atmosphere, 9: 1298(J)

scattering by nuclei, magnetic effects, 9: 1109(J)

Mesons(μ^-)

decay, cloud chamber study, 9: 4253

mass of, from precision π^- mass determination and previously measured π^--μ^- mass difference, 9: 338(J)

production and radiochemical analysis of beams of, 9: 1057(J)

Mesons (μ^+)

mass of, from precision π^- mass determination and previously measured π^--μ^- mass difference, 9: 338(J)

Mesons (π)

absorption by heavy nuclei, 9: 1385(J)

beta decay, attempt to find, 9: 4254

collisions with nucleons, γ rays from, 9: 2032(J)

double and single production at 1000 Mev, perturbation calculation for, 9: 723(J)

formation by collision of nucleons at near threshold energy, 9: 3958(J)

interaction with nucleons, approximate treatment, 9: 2083(J)

interactions in photographic emulsions, 9: 3616(J)

interactions with nucleons, Λ^0 production from, 9: 1986(J)

interactions with nucleons, review in Annual Review of Nuclear Science, 9: 4008(J)

multiple production of, in pion–nucleon collisions at 1 bev, analysis with statistical theory, 9: 793(J)

multiple production by meson-, γ-, and nucleon-nucleon collisions, 9: 2009(J)

pair formation (π^3) in nuclear emulsion, 9: 4256(J)

photoproduction cross sections, calculation from nuclear isobaric states, 9: 2883(J)

photoproduction of, matrix elements for double, 9: 327(J)

production by neutrons on He, 9: 3954

production by protons and photons, 9: 2890(R)

production of heavy unstable particles by 1.37-Bev, 9: 4257(J)

production spectra in atmosphere, 9: 1298(J)

range-energy and energy-momentum relations, tables, 9: 402

range-energy relations of, in nuclear emulsions, 9: 3939(J)

scattering by heavy nuclei in nuclear emulsions, theory of, 9: 1142(J)

scattering by nucleons, 9: 2034(J)

scattering by nucleons, theoretical analysis of, 9: 403(J)

scattering by protons, tables, 9: 2930

scattering in nuclear emulsions, 9: 777

scattering of, by nucleons, theory, 9: 329(J), 722(J)

scattering of 160-Mev, by protons in nuclear emulsions, 9: 1108

Mesons (π^-)

angular distribution between π^+ mesons and, in θ^0 decay, 9: 4259(J)

interactions with protons at 1.4 bev, 9: 2940(J)

mass, precision measurement from radiative absorption in H, 9: 338(J)

produced by neutron bombardment of deuterons, 9: 2914

production (π^+/π^-) ratios from C by 310-Mev, 9: 2434(J)

rest mass, 9: 1985(J)

scattering by protons with heavy-particle production, 9: 1666(J)

scattering from D at 119-Mev, angular distribution, 9: 2488(J)

Mesons (π^0)

formation by 670-Mev proton reactions, relation to absorber atomic weight, 9: 3607(J)

gamma decay of, damping effect in, 9: 336(J)

life of, radiation corrections in, 9: 332(J)

lifetime and π^0/charged particle ratio from analysis of 3×10^{12} ev cosmic shower, 9: 1927(J)

mass of, from precision π^- mass determination and previously measured π^-- π^0 mass differences, 9: 338(J)

photoproduction from protons at 170 to 340 Mev, 9: 1987(J)

photoproduction in H, differential cross sections from 180 to 215 Mev at 135^0, 9: 4261(J)

photoproduction in nuclear emulsions and C, 9: 1066(R)

photoproduction of, distribution in, theoretical calculations, 9: 1984(J)

photoproduction of, in H_2, 9: 3609(J), 3610(J)

photoproduction total cross sections from threshold to 240 Mev in H, 9: 4260(J)

Mesons(π^0) (Cont'd)
production of, in n-p collisions, 9: 784(J)
Mesons (π^+)
absorption reactions ($\pi^+ + d \rightarrow p + p$) at 76 and 94 Mev, cross sections, 9: 424(J)
angular distribution between π^- mesons and, in β^0 decay, 9: 4259(J)
formation in p(p,π)d reaction at 460 Mev, 9: 3605(J), 4287(J)
formation in p(p,π)d reaction at 510 to 660 Mev, 9: 3606(J)
formation of, from interaction of polarized protons, 9: 790(J)
multiple Coulomb scattering and residual range in nuclear emulsions, relation between, 9: 4306(J)
photoproduction from H near threshold, 9: 4258(J)
photoproduction in hydrogen, 9: 1066(R)
production from C by 310-Mev bremsstrahlung, 9: 2434(J)
production from p-p interactions, 9: 3652(J)
production of high-energy electron pairs by, in nuclear emulsion, 9: 1664
scattering and absorption in lead, 9: 2929
scattering and Coulomb interference of 113-Mev, with protons, 9: 1337(J)
Mesons (τ)
decay of, in nuclear emulsions, 9: 725(J)
review of, in Annual Review of Nuclear Science, 9: 3957(J)
Mesons (τ^+)
decay in flight, 9: 4255(J)
similarity to V_2^0 particles, 9: 334(J)
Metabolism
(See also appropriate subheadings under specific materials and organisms; see also Animal metabolism; Plant metabolism.)
effects of radiation on, in eggs and embryos of grasshoppers, 9: 495(J)
effects of x rays on, of radioactive glutathione in mice, 9: 15
of formates and carbonates by normal and irradiated chick embryos, tracer study, 9: 3376
of inhaled carbon in rats, tracer study, 9: 2611(J)
of iodine by thyroid gland, effects of dietary fluorine, tracer study, 9: 2610(J)
of iron by erythrocytes in bone marrow, 9: 3007
of iron, effects of total-body x irradiation on, in duck erythrocytes, 9: 2580(J)
of lipoproteins, effects of radiation on in rabbits, dogs, rats, and mice, 9: 3009
of lipoproteins, effects of total-body x irradiation on, in rabbits, 9: 1446
measurement, in humans, equipment for tracer study, 9: 2136(R)
in normal and leukemic leukocytes, enzymatic factors, 9: 6
role of, in oxygen effect in x-irradiated bacteria an yeasts, 9: 24(J)
of sulfanilamide and phenolic compounds, effects of total-body irradiation on, in guinea pigs and rats, 9: 480(R)
Metabolism cages
for exposure of small animals to radon atmosphere, design, 9: 1728
Metal coatings
(See also appropriate subheadings under specific metals; see also Coatings.)
fused-in-place spray, preparation, metallurgical nature, and applications, 9: 4194(J)
fused self-fluxing, practical hard facing with, 9: 3529(J)
Metal couples
(See also Ceramic–metal couples.)
bonding and electric properties, 9: 3523
Metal crystals
(See also Alkali metal halide crystals.)
properties, theoretical analysis, 9: 3908(J)
Metal-foil detectors
neutron flux depression, 9: 3291(J)
Metal–gas systems
bibliography, 9: 963
Metal powders
(See also specific metal powders.)
preparation by electrolysis of fused salts, 9: 2744(J)
sintering and annealing, 9: 1891(J)
Metallic films
(See also headings for foils or films identified by material; see also Coatings; Metal coatings.)
surface area of Ni, Fe, Rh, Mo, Ta, and W, measurement, 9: 3887(J)
x-ray-diffraction analysis of surface properties, 9: 186
Metallic foams
formation of low-density core material of Al–Mg alloy, for sandwich construction, design of equipment for, 9: 3182
formation of low-density, for sandwich construction, methods and equipment for, 9: 3181
Metallography
apparatus for electropolishing specimens, 9: 2328(J)
equipment modification for remote operation, 9: 2194
etching and polishing procedures for W and Mo, 9: 1865(J)
etching of steel by ionic bombardment, 9: 1280(J)
remote equipment for high-activity, 9: 562(J)
sample preparation, procedure and equipment for, 9: 563(J)
sample preparation, use of ultrasonic cleaning in, 9: 567(J)
universal polishing method, 9: 3879(J)
use of N. H. P. mounting plastic in, 9: 149(J)
Metallurgical Advisory Committee on Titanium
progress reports on Ti research and development, 9: 2730
Metallurgical equipment
mist cooling in machine tool practice, health hazards, 9: 2723
Metallurgical Labs., Dow Chemical Co.
progress reports, 9: 3840(R)
progress reports on fabrication and properties of Mg alloys, 9: 1852(R)
progress reports on high-strength Mo alloys, 9: 4160(R)
progress reports on natural and synthetic films on Mg and Mg alloys, 9: 3852(R)
Metallurgical Labs., Sylvania Electric Products, Inc.
progress reports on plastic flow and recrystallization on Ti, 9: 3872(R), 3873(R)
progress reports on principles of the effect of rare earth additions on the high-temperature properties of Mg, 9: 4161(R)
Metallurgy
(See also subheadings under specific materials; see also Electrometallurgy; Powder metallurgy; Tracer techniques (metallurgy).)
applications of radioisotopes in studies of, conference, 9: 3807(J)
cold-working, deformation faults in, 9: 2778(J)
electron-optical methods in constitutional, 9: 2327(J)
power requirements in extrusion and punching, theoretical determination, 9: 4193(J)
progress in metal physics, 9: 2305(J)
of radioactive materials, laboratory design, 9: 575(J)
review of nonferrous, 9: 4200(J)
techniques of fiber, 9: 3538(J)
Metals
(See also specific metals, alloys, etc.)
active, purification of rare gases by, 9: 2382
adhesive bonding of, ultrasonic inspection, 9: 1263(R)

Metals (cont'd)

adsorption and exchange in metal-metal ion systems, review, 9: 121(J)

analysis, electronics in direct reading spectrometers for, 9: 3948(J)

annealing of cold-worked, 9: 980(J)

atmospheric corrosion and storage, 9: 3824

bibliography on the determination of thermal conductivity of, at elevated temperatures, 9: 1535

bonding, 9: 3523, 4114(R)

brittleness and plasticity of, new criterion for, 9: 1867(J)

coating by dispersion of Ti and metal sheets in close proximity in fused salts, 9: 2307(J)

compressibility parameters and Grüneisen's constants, 9: 1863

corrosion by liquid NaOH at 1000 and 1500°F, 9: 1508

corrosion resistance and applications of construction, survey and directory of, 9: 137(J)

cost ratings of various, 9: 2254(J)

creep properties of, under intermittent stressing and heating conditions, 9: 3521

derived equations of state for, from shock wave measurements,

diffraction and inelastic scattering of 10^2 to 2×10^3 ev electrons, 9: 283(J)

diffusion and oxidation of, review, 9: 3206(J)

effects of radiation on electron emission, 9: 3208(R)

electrode potentials of, in molten salts, 9: 522(J)

energy loss of 22-kev electrons, 9: 1661(J)

extension of Matthiessen's Rule to cold-worked, 9: 1536(J)

extrusion and punching, power requirements in, theoretical determination, 9: 4193(J)

field-emission microscopy, 9: 2741

film formation, mathematical analysis, 9: 3884(J)

freshly formed surfaces of, reactivity, 9: 3542(J)

galling and seizing, in prevention of, 9: 2745(J), 2746(J)

intergranular oxidation, 9: 4185

irradiation disordering of, mechanism, 9: 4012(J)

isotopic migration and selfmigration in, 9: 1954(J)

metallographic etching, mechanisms of, 9: 646(J)

methods for etching, of W and Mo metallographic specimens, 9: 1865(J)

multistage batch separation by zone melting, 9: 2753(J)

nuclear magnetic moments, 9: 2895

number of vacancies and energy of vacancy formation in, 9: 3525(J)

oxidation of, under conditions of linear temperature increase, 9: 182

paper chromatographic determination of trace, in geochemical ore prospecting, 9: 2264(J)

plasticity, hardening, and recrystallization, theoretical analysis, 9: 3908(J)

pressing, evaluation of heat transfer fluids for, 9: 4114(R)

properties of transition, and their alloys, 9: 979(J)

protective coatings for, book on, 9: 4144(J)

purification by zone melting, design and performance of apparatus for, 9: 1855

rapid combustion of, in air, a literature survey, 9: 3178

rare, handbook on, 9: 2245(J)

remote polishing and metallographic analysis of irradiated, 9: 562(J)

remote sampling by electrolytic drilling, apparatus and procedure, 9: 3862

scaling of, kinetics, 9: 638

shock wave separation into elastic and plastic components in, techniques for observing, 9: 3903(J)

size of interstitial solute atoms in close-packed, calculated from observed α-ray lattice expansion data, 9: 1780(J)

Metals (cont'd)

solid-state diffusion bonding by pressure welding and electrolytic deposition of Ti as an adherent layer on, 9: 3477(R)

solubility in liquid metals, equipment and procedures for studying, 9: 3501

sputtering in, radiation damage theory, 9: 3898(J)

surface diffusion coefficients, interferometric method for measuring, 9: 3455

surface tension values for 27, 9: 207(J)

thermal conductivity of, apparatus for measuring, in vacuum at high temperatures, 9: 3554(J)

thermal rupture, effects of atmosphere reaction, 9: 2718

thermal shock, apparatus for testing, 9: 4179(R)

thermalization of positrons in, 9: 4001(J)

transition, valence calculations of, 9: 2736

vacuum fusion analysis of, for gases, apparatus for, 9: 3406(J)

vapor-pressure determination with radioisotopes, 9: 1883(J)

void formation, theoretical analysis, 9: 2330

weld cracking of, literature survey, 9: 1532

x-ray-diffraction analysis of surface properties, 9: 186

x-ray-diffraction studies of, under controlled stress at elevated temperature apparatus for, 9: 277(J)

Metals (liquid)

applications in reactor technology, 9: 3643(J)

bibliography of, as reactor coolants, 9: 1060

chemical reactions with water, 9: 4179(R)

circulation and heat-transfer system of graphite-liquid Sn for high temperatures, 9: 139

densities of, measurement at temperatures up to 1000°C, 9: 3386

handling of, design, fabrication, operation, and testing of apparatus for, 9: 3443

heat transfer, review of experimental investigations of, 9: 3125

level indicator for, design, 9: 4231

physical properties and use as high-temperature heat-transfer media, applications to nuclear power production and gas turbines, 9: 3443

surface tension of, measurement and calculation, 9: 170

Metals Research Lab., Carnegie Inst. of Tech.

progress reports on electrochemical studies of nonaqueous melts, 9: 1467(R), 2135(R)

Metamorphosis

of axolotls, effects of age, coloring, and sex, 9: 471(J)

Metatorbernites

occurrence in Austin area, 9: 1257

Metatyuyamunites

occurrence in Sundance formation (Wyo.), 9: 956(J)

Meteorites

age of, by the A^{40}/K^{40} method, 9: 1915(J)

isotopic composition of H and C in carbonaceous, 9: 1834(R)

origin and age estimations, 9: 3226(J)

Meteorology

(See also as subheading under specific sites, installations, and geographic areas; see also Atmosphere; Stack disposal.)

atmospheric turbulence study at Brookhaven Lab., 9: 341

effects of atomic explosions on weather, 9: 1990(J)

effects of thermonuclear explosions on, 9: 3274(J)

experimental stack for study of effects of meteorological conditions on stack disposal, 9: 4263(J)

Methane

adsorption on rutile, 9: 3113(J)

ion pair formation, 9: 4039(R)

yield from decomposition of methanol by Co^{60} gamma radiation and 28-Mev He ions, 9: 2202(J)

Methane (liquid)
solubility of H in, at temperatures from 90.3 to 127.0°K and at pressures from 180 to 230 atm., 9: 241(J)
Methane, bromotrifluoro-
Raman and infrared spectra, 9: 895(J)
Methane–carbon dioxide systems
viscosity of, at 25°C, 9: 3213
Methane, chlorodifluoro-
microwave spectra and dielectric constants, 9: 342
Methane, dichlorodifluoro-
reaction with Te, 9: 3419(J)
Methane, iodo-
reaction with pyridine, 9: 2646(J)
Sellard-Chalmers reaction in, temperature effects on, 9: 3093(J)
Methane, nitro-–water systems
mass transfer in a horizontal liquid-liquid extraction tube, properties affecting the film coefficients of, 9: 2208
Methane, trifluoroiodo-
hyperfine splitting of the J = O → 1 transition of, 9: 1773(J)
Raman and infrared spectra, 9: 895(J)
Methyl alcohol
(See Methanol.)
Methanol
decomposition of, by Co^{60} gamma radiation and 28-Mev He ions, 9: 2202(J)
Methanol–borine, trimethoxy- systems
electrolytic decomposition, 9: 516
Methanol–water systems
decomposition of, by Co^{60} gamma radiation, formaldehyde and ethylene glycol yields from, 9: 2203(J)
Methanols, triphenyl-
hydrogen exchange between T-labeled, and aliphatic alcohols, 9: 2331(R)
Methionine
metabolism of, in chick embryo, tracer study, 9: 2099(R)
Methylamine
complexes of, with rare earth(III) chlorides, 9: 2667(J)
direct fluorination, 9: 890
Mica
age measurements by Rb^{87}–Sr^{87} method, possible source of error in, 9: 3474(J)
Mice
lethal dosage determination of radiation for, 9: 1720
lethal effects of radiation, 9: 2567(J)
mange in, control, 9: 2547(R)
metabolism of Te^{132}–I^{132} mixtures in, 9: 3754(J)
newborn, effects of x radiation, 9: 2556(J)
pathological effects of chronic γ irradiation, 9: 2563(J)
spontaneous tumors in, a literature survey, 9: 2545(J)
weight of, effects of total-body irradiation on, 9: 477
Microanalysis
applications of curved-crystal x-ray spectrometers in, 9: 3435(J)
Microörganisms
(See also Bacteria and specific bacteria; see also Protozoa.)
causing spoilage of food, radiosensitivity, review of literature, 9: 2549
life span of experimental, effects of aureomycin, moving and cages on, 9: 3(R)
radiosensitivity of, effects of cell concentration and oxygen tension, 9: 1723(R)
Microscopes
(See also Electron microscopes.)
design of traveling, for measuring photographic plates, 9: 2396(J)
emulsion scanning, design, 9: 2853
interference, techniques for study of surfaces, 9: 669(J)
Microscopy
high-temperature phenomena, heated thermocouple attachment for observation of, 9: 1589
Microwave equipment
(See also Electron tubes.)
fabrication of TiO_2 wave guides for linear accelerators, 9: 1096
Stark modulation absorption cell for reactive molecules, 9: 1062(J)
for studies of line broadening and dielectric relaxation in compressed gases, 9: 342
Microwave oscillators
for generating in the 100 to 1000 micron range, design and performance, 9: 2885(R)
for generating in the 100 to 1000 micron range, performance, 9: 2886(R)
Microwave spectrometers
for detecting radiation in the 100 to 1000 micron range, design and performance, 9: 2286(R), 2885(R)
design of simple high-temperature, 9: 343(J)
Microwave spectroscopy
atomic mass determinations by, 9: 729(J)
determination of hyperfine splitting in ground state of atomic H by, 9: 454(J)
of gases, review of recent developments, 9: 3347(J)
review, 9: 3971(J)
Mikado Claim (S. Dak.)
uranium and Th distribution, 9: 165(J)
Miller House Area (Alaska)
geology, 9: 628(J)
Mine Safety Appliances Co.
progress reports, 9: 4175(R)
progress reports on liquid metal technology, 9: 4179(R)
progress reports to Detroit Edison Co., 9: 1897(R), 1898(R), 1899(R), 1900(R), 1901(R), 1902(R), 1903(R), 1904(R)
Mineral Point Area (Alaska)
exploration, 9: 628(J)
Minerals
(See also Radioactive minerals.)
age determination by potassium-argon decay, 9: 625(J)
application of election microscopes to study of, 9: 3830(J)
dating of, by determination of ratio of A^{40}/K^{40}, 9: 3463(J)
determination of Th and Ra contents of, with proportional counters, 9: 957(J)
flotation, theoretical analysis of, 9: 148(J)
potassium age determinations of, by neutron activation analysis, 9: 2713(J)
volumetric analysis for U in complex, 9: 542(J)
Minerals Research Lab., Inst. of Engineering Research, Univ. of Calif., Berkeley
progress reports on fracture of Mg alloys at low temperature, 9: 3172(R)
Minnesota Mining and Manufacturing Co.
progress reports on synthesis and evaluation of new polymers, 9: 3083(R)
Minnesota Univ.
progress reports on geological exploration, 9: 1514(R)
Mitochondria
structure of, in Paramecium and frog oöcytes, 9: 3(R)

Mixers

for preparing accurately blended gas samples, design, 9: 3570

Mixing

of particulate solids, fundamental study of, 9: 1472(J)

Moab Bridge Area (Utah)

geology and exploration, 9: 1256

Moab District (Utah)

occurrence of schroeckingerite in, 9: 958(J)

Molds

(See also Dies.)

design, for low-density foamed Al–Mg alloys, 9: 3182

Molecular beams

(See also Ion beams.)

oscillator design, 9: 731(R)

scattering of, from surfaces, 9: 650

Molecular structure

analysis by birefringence, 9: 2164

computer applications to solutions in theory of, 9: 231(R)

determination of, from the Raman effect, 9: 1339(J)

of gases, 9: 342

Molecules

calculation of energy levels for internal torsion and over-all rotation for CH_3BF_2 type, 9: 2438(J)

diatomic, atomic polarizations of, theory, 9: 2888(J)

dissociation energies of gaseous, 9: 2437

excitation of, by β decay of a constituent atom, 9: 2995(J)

excitation of, by β radiation, 9: 4101(R)

Monte Carlo calculation of average extension of molecular chains, 9: 2889(J)

probability distribution of x-ray intensities in, 9: 2494(J)

scatter of high-energy electrons from diatomic, to simple cubic lattice, 9: 2495(J)

Molybdates

water solubility, hygroscopic deliquescency, room-temperature crystal structure, melting point, weight stability during heating, specific gravity, and number of phases from 0° to 1000°C, 9: 3146

Molybdenites

caustic leaching, ratio of, in temperature range of 100 to 200°C, 9: 2207(J)

preparation of reduced Mo chlorides from, 9: 2223(J)

Molybdenum

absorption of cosmic μ mesons, 9: 721

adsorption of O_2, H_2, and CO on evaporated films of, 9: 2159(J)

analytical methods for impurities in, 9: 633

anisotropy, mechanical properties, effect of MoO_2 and MoO_3 inclusions on mechanical properties, and preparation, 9: 1527(R)

brazing, riveting, and welding, mechanical properties of, 9: 1527(R)

brazing of, for high-temperature uses, 9: 2781(J)

compressibility parameters and Grüneisen's constants, 9: 1863

creep-rupture strength of, 9: 633

detection of, on Al by colorimetric spot tests, 9: 1196

diffusion of Co in, 9: 1276(J)

electric excitation energy levels, 9: 4205(R)

electrolytic preparation, electrode potentials in, 9: 2147(J)

electrolytic preparation of, from solution of K_3MoCl_6 in molten alkali halides, 9: 2221(J)

extension of Matthiessen's Rule to cold-worked, 9: 1536(J)

fabrication, mechanical properties, microstructure, and welding of, 9: 974

fatigue properties of arc-cast and powder-metallurgy, at room temperature, 9: 2751(J)

Molybdenum (cont'd)

film-surface area of evaporated, measurement, 9: 3887(J)

forging in inert gas, 9: 984(J)

gravimetric determination of, in $MoBr_3$, 9: 2792(R)

improvements in room-temperature ductility of, by various heat treatments, 9: 633

indirect determination by a complexometric method, 9: 3401(J)

initiation of discontinuous yielding in ductile, 9: 633

ion exchange separation of Re from, 9: 1223(J)

microstructure of, effect of clamping distance and plates acceleration on, 9: 3531(J)

oxidation, 9: 633

oxidation of, under conditions of linear temperature increase, 9: 182

parabolic flashing of ½ in. sintered-and-wrought, temperature distribution during, 9: 3531(J)

photonuclear reactions, 9: 2449(J)

physical properties for furnace design, review, 9: 1213

polishing and etching of metallographic specimens of, method for, 9: 1865(J)

powder metallurgy and mechanical properties, 9: 2274(R)

preparation of, by H_2 reduction of Mo oxides, 9: 633, 4180

production from molybdenites by high temperature-high pressure caustic leaching, 9: 2207(J)

properties of, 9: 1527

proton reactions (p,n), angular distributions and yields at 23 Mev, 9: 4290(J)

radiochemical determination, 9: 876, 2634

repeated arc melting of, under vacuum, 9: 633

separation of, by anion exchange, 9: 912(J)

solid solubility of impurities and their effects on ductility of, 9: 633

solid-state purification of, 9: 633

spectrographic determination of, in ores and rocks, 9: 162

tensile properties and ductility of as-received and recrystallized, 9: 1848(R)

thermal conductivity and thermal expansion, 9: 1266

vapor deposition of, on Ti and Ti alloys, 9: 2752(J)

wetting by liquid Na, 9: 229(J)

welding procedures and ductility of weldments of, 9: 633

Molybdenum alloys

casting and forging for gas turbine application, 9: 3869

oxidation of binary and ternary, 9: 633

powder metallurgy and mechanical properties, 9: 2274(R)

Molybdenum–aluminum–chromium–titanium alloys

phase structures and tensile properties of as-produced, 9: 2279(R)

Molybdenum–aluminum–cobalt alloys

oxidation at 954°C, 9: 3146

Molybdenum–aluminum compounds (intermetallic)

crystal structure, 9: 2373(J)

Molybdenum–aluminum–titanium alloys

creep and tensile properties of as-forged and heat-treated, effect of structure on, 9: 2279(R)

effects of heat treatment on elevated-temperature tensile properties and microstructure, 9: 2719(R)

hardness, crystal structure, and phase studies, 9: 3520

melting techniques and forging temperatures for preparation of, 9: 1980

Molybdenum–boron–chromium systems

physical properties, 9: 150(R)

Molybdenum bromides

preparation, purification, and analysis of, 9: 2792(R)

Molybdenum–carbon–titanium systems
forging in inert gas, 9: 984(J)
grain growth and size, microstructure, phase studies, and tensile properties of heat-treated, 9: 975
Molybdenum chlorides
preparation of, 9: 2222(J)
preparation of reduced, from molybdenite concentrate, 9: 2223(J)
reduction of, to prepare Mo, 9: 633
Molybdenum(V) chlorides
hydrogen reduction of, preparation of Mo by, 9: 1527
Molybdenum–chromium–iron–manganese–titanium alloys
mechanical properties and microstructure of extruded and heat treated, effects of temperature, pressure, and die angle on, 9: 2276(R)
Molybdenum–chromium–iron–manganese–titanium–vanadium alloys
heat treatment, mechanical properties, phase studies, tensile properties, and welding, 9: 2298
tensile properties, hardness, and flash weldability, 9: 3856
Molybdenum–chromium–iron–nickel alloys
tensile properties, creep-rupture at 1350 and 1500°F, and microstructure, 9: 3859
Molybdenum–chromium–iron–titanium alloys
tensile properties and ductility, 9: 1848(R)
Molybdenum–chromium–manganese–titanium alloys
microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296
Molybdenum–chromium–nickel alloys
oxidation at 950°C, 9: 3146
weldability of wrought, 9: 3530(J)
Molybdenum–chromium–nickel–tungsten alloys
compressive-stress-rupture properties of high temperature, 9: 3503(R)
Molybdenum–chromium–titanium alloys
effects of grain size on the mechanical properties of, 9: 1837(R)
mechanical properties of, effects of grain size and heat treatment on, 9: 3402(R)
Molybdenum–chromium–titanium boride systems
refractory properties, 9: 4137(R)
Molybdenum coatings
adhesion of vapor-deposited, 9: 4162(R)
Molybdenum–cobalt alloys
creep-rupture strength of, 9: 633
oxidation testing at 940°C, 9: 3146
Molybdenum–cobalt–manganese alloys
oxidation at 940°C, 9: 3146
Molybdenum–cobalt–nickel–tungsten alloys
compression-creep properties, 9: 3504(R)
Molybdenum–cobalt–silicon systems
oxidation at 945 ± 10°C, 9: 3146
Molybdenum–iron alloys
catastrophic oxidation of, effect of Ni and Cr on, 9: 1275(J)
oxidation kinetics, 9: 1274(J)
Molybdenum–iron–nickel alloys
oxidation at 920 and 1110°C, 9: 3146
Molybdenum–iron–titanium alloys
hardness, heat treatment, mechanical properties, phase studies and welding, 9: 2298
Molybdenum isotopes
Szilard-Chalmers concentration, 9: 1959(J)
Molybdenum isotopes Mo^{90}
decay schemes, 9: 735, 4328(J)
Molybdenum isotopes Mo^{91}
decay schemes and energy levels, 9: 3334(J)
Molybdenum isotopes Mo^{92}
neutron binding energy, 9: 3334(J)
Molybdenum isotopes Mo^{96}
energy levels, literature survey, 9: 2068(J)
Molybdenum isotopes Mo^{99}
decay scheme, 9: 2071(J)
fission yield of, from U^{235} and U^{238}, fine structure in, 9: 670(J)
Molybdenum isotopes Mo^{101}
fission yield of, from U^{235} and U^{238}, fine structure in, 9: 670(J)
Molybdenum isotopes Mo^{102}
fission yield of, from U^{235} and U^{238}, fine structure in, 9: 670(J)
Molybdenum–manganese–nickel alloys
oxidation at 940°C, 9: 3146
Molybdenum–nickel alloys
oxidation kinetics, 9: 1274(J)
oxidation testing at 930, 940, and 945°C, 9: 3146
weldability of wrought, 9: 3530(J)
Molybdenum–niobium alloys
creep-rupture strength of, 9: 633
Molybdenum oxides
electric properties of, for nuclear batteries, 9: 266
heat and free energy of formation, 9: 529(J)
reduction, by H_2, 9: 4180
Molybdenum–palladium couples
development of, for high temperature measurements, 9: 185
Molybdenum powders
resistance sintering under pressure, 9: 1878(J)
Molybdenum silicides
corrosion resistance in air, 9: 1248
creep and stress-rupture properties at 1600°F to 2000°F, 9: 1251
fabrication and mechanical and physical properties, 9: 1248
mechanical properties of, influence of carbon content and method of fabrication on, 9: 1250
thermal capacity and thermal conductivity of hot-pressed, measurement of, 9: 1504
thermal conductivity, 9: 946(R)
thermal conductivity from 300 to 800°C, 9: 1252
thermal-shock resistant properties of, in turbine blades, 9: 1249
Molybdenum steel
embrittlement of, effect of temperature range 1100 to 1150°F, 9: 2758(J)
isothermal embrittlement in, during tempering from 800°F to lower critical temperature, 9: 4188
Molybdenum sulfides
lubricity for high-temperature ball bearings, 9: 1813
Molybdenum–thorium–tungsten alloys
forging in inert gas, 9: 984(J)
Molybdenum–tin alloys
martensitic transformations in, 9: 200(J)
Molybdenum–titanium alloys
creep and rupture behavior at 600 to 1000°F, 9: 3483
creep and tensile properties of as-forged, effect of structure on, 9: 2279(R)
creep-rupture strength of, 9: 633
effects of heat treatment on elevated-temperature tensile properties and microstructure, 9: 2719(R)
grain boundary diffusion in, as bonding agent between Ti and steel, 9: 4182
grain growth, effects of dispersed carbides, 9: 3486(R)

Molybdenum–titanium alloys (cont'd)
grain growth and size, microstructure, phase studies, and tensile properties of heat-treated, 9: 975
martensitic quench products and α′ tempering, 9: 1843(R)
mechanical properties, effect of H on, 9: 1857(R)
microstructure of heat-treated, 9: 2275(R)
phase studies and mechanical properties, 9: 1841(R)
plastic deformation and preferred orientation, 9: 1836(R)
preparation, microstructure, phase studies, heat treatment effects, and mechanical properties, 9: 2729(R)
tempering of α′ phase in, 9: 1844(R)
tensile properties at room temperature, effects of creep test conditions on, 9: 2275(R)
Molybdenum–titanium–vanadium alloys
hardness, influence of cooling rate on, 9: 1842(R)
phase studies, 9: 1844(R)
phase studies and hardness of, cooled by oil, water, and air, 9: 1843(R)
Molybdenum–vanadium alloys
creep-rupture strength of, 9: 633
forging in inert gas, 9: 984(J)
Molybdenum–zirconium alloys
fabrication, 9: 1530(R)
creep-rupture, 9: 190
fabrication and tensile properties of, from −195 to 500°C, 9: 3180(R)
Monazites
(See also Thorium ores; Uranium ores.)
chemical processing for recovery of Th, U, and rare earths, 9: 592(J)
Monel metal
(See Nickel alloys.)
Monkeys
discrimination learning by, 9: 4
lethal dosage determination of radiation for, 9: 1720
lethal effects of radiation, 9: 2567(J)
memory, effects of radiation, 9: 478, 479
Monsanto Chemical Co., Dayton
progress reports on development of high-temperature base stock for hydraulic fluids and lubricants, 9: 4120(R)
Montana (Beaverhead Co.)
uranium and Th deposits in Deer Creek and Lemhi Pass districts in, 9: 1520(J)
Montana (Jefferson Co.)
exploration of Clancey Mining District in, 9: 1518(J)
geology of the Free Enterprise Mine Area in, 9: 1519(J)
Montana (Madison Co.)
uranium and Th deposits in Melrose District in, 9: 1520(J)
Montana (Silver Bow Co.)
uranium and Th deposits in Melrose District in, 9: 1520(J)
Monte Carlo method
calculation of average extension of molecular chains by, 9: 2889(J)
Montmorillonites
adsorption of fission products on, as waste disposal process, 9: 929(J)
adsorptive properties of, for fission products, 9: 1234
Monument Valley District (Ariz.)
mineralogy, 9: 1829
Motors
electroplating of motorettes with Cd and Cr, 9: 1554(R)
Mount Pisgah uranium deposits (Penna.)
exploration of, in Carbon Co., 9: 164(J)
Mount Taylor Area (N. Mex.)
geophysical exploration, 9: 2709
Mountain Pass District (Calif.)
geology and rare-earth mineral deposits, 9: 3837(J)
Muddy River Area (Utah)
mineralogy, 9: 1829
Muscles
beef, proteolytic enzyme activity of, effects of γ radiation, 9: 2116(J)
mechanism of contraction of, role of hydrolysis of adenosinetriphosphate, 9: 473(J)
electrolyte retention in, following irradiation, 9: 3032(J)
Mutations
effects of ionizing radiation inducing, 9: 490(J)
induced by radiation in protozoa, 9: 1716(J)
in natural populations of Drosophila, genetic factors, 9: 5(R)
radioinduced, in barley, as a test for physiological effects of radiation, 9: 1159(J)
radioinduced, in Drosophila, 9: 30(J), 3021(J), 3023(J), 3731(J)
radioinduced, in eggs of Habrobracon, effects of oxygen on, 9: 2502(J)
radioinduced, in fungi, 9: 29(J)
radioinduced, in maize, 9: 28(J)
somatic, produced by chronic exposure to γ radiation in carnations, 9: 4044

N

Nabesna Mine (Alaska)
exploration, 9: 628(J)
Nacimiento District (N. Mex.)
geophysical exploration, 9: 2709
Nagasaki
effects of atomic explosions on residents, summary, 9: 3745(J)
residents of, medical effects of atomic bombs on, statistical analysis, 9: 2535
1-Naphthol, 2-nitroso-
separation of Co^{56}, Co^{57}, and Co^{58} from Mn with, 9: 119(J)
Natalia Claim (Ariz.)
exploration of, 9: 161
National Bureau of Standards
handbook on marine waste disposal, 9: 604(J)
progress reports on alignment of Ce^{141} and Nd^{147} nuclei, 9: 354(R)
progress reports on development of heat-resistant polymers, 9: 3082
radiation standards produced by, facilities and availability, 9: 2513(J)
Natural Resources Research Inst., Univ. of Wyo.
progress reports on lime bonded and stabilized with TiO_2 as a refractory, 9: 945(R)
Naval Research Lab.
progress reports on engineering physics of dielectrics, 9: 1553(R), 1554(R)
progress reports on thermal and related physical properties of molten materials, 9: 634(R), 1466(R)
Neodymium
Coulomb excitation of, 9: 2073(J)
energy levels and L absorption spectra, 9: 2899(J)
hyperfine structure, 9: 1686(J)
magnetic susceptibility, 9: 3695(J)
natural radioactivity, 9: 804(J)
paramagnetic resonance absorption spectra, 9: 2075(J)
solvent extraction of, into TBP and into a TBP and TTA mixture in kerosene, 9: 906
Neodymium isotopes Nd^{143}
nuclear magnetic moments, 9: 1686(J)

Neodymium isotopes Nd^{144}
energy levels, 9: 1403(J)
Neodymium isotopes Nd^{145}
nuclear magnetic moments, 9: 1686(J)
Neodymium isotopes Nd^{147}
disintegration of, coincidence studies, 9: 3686(J)
nuclear alignment, γ spectra, and magnetic moments, 9: 354(R)
Neodymium isotopes Nd^{150}
beta stability, 9: 1671(J)
Neodymium nitrates
preparation of anhydrous, by reaction of oxides and NO_2, 9: 112(J)
Neodymium oxide–uranium(VI) oxide systems
phase studies, 9: 925
Neodymium oxide–zirconium oxide systems
heat treatment, phase studies, and thermal expansion, 9: 3141(J)
Neodymium sulfates
symmetry of local crystalline field about ions in $Nd_2(SO_4)_3 \cdot 8H_2O$ crystals, 9: 2981(J)
Neon
energy loss of positive ions scattered in, 9: 1377(J)
gamma reactions, N^{17} yield curve from, 9: 3644
ionic species formed by collision of gaseous ions in, 9: 1378(J)
ionization by α particles and fission fragments, 9: 2821
shell theory for, and other A = 19 nuclei, 9: 4267(J)
solidified, compressibilities at low temperature, 9: 2824(J)
variations in isotopic abundances of, extracted from radioactive minerals, 9: 626(J)
Neon isotopes
positron decay, F^{19} assignments from, 9: 363(J)
thermonuclear reactions of protons with, in stars, 9: 3647(J)
Neon isotopes Ne^{19}
beta decay, electron-neutrino angular correlation in, 9: 2059(J)
beta spectra, 9: 441(J)
Neon isotopes Ne^{20}
deuteron reactions (d,p), proton groups from, 9: 3304(J)
energy levels, 9: 1349(J)
scattering of 9.5-Mev protons, 9: 1390(J)
Neon isotopes Ne^{22}
energy levels, 9: 1133
internal conversion of the 1.28-Mev γ-ray and energy levels of, 9: 1678(J)
Nephelometers
photo-, instrumental variability of model 7 Coleman, 9: 3396(J)
Nephrosis
syndrome of, in children, 9: 2099(R)
Neptunium
radiometric determination, 9: 2634
Neptunium isotopes Np^{236}
long-lived isomer of, formation, beta half life, and fission cross sections, 9: 2055(J)
Neptunium isotopes Np^{238}
gamma decay of, relative intensities of 100-kev and 1-Mev peaks in, 9: 61(R)
Neptunium isotopes Np^{239}
nuclear spin, 9: 61(R)
nuclear spin from hfs pattern, 9: 360(J)
Neptunium isotopes Np^{240}
half lives, 9: 61(R)
Neptunium(IV) sulfate complexes
thermodynamics of reactions of, 9: 923(J)
Neptunyl ions
electronic structure and magnetic properties, 9: 4035(J)
Nerve cells
or brain, pathological effects of radiation on, in primates, 9: 831(J)
Nerves
isolated, conduction velocity, effects of radiation on, in bullfrogs, 9: 3727
velocity of conduction in, effects of x radiation on, from frogs and rabbits, 9: 2582(J)
Network theory
matrix analysis of 4-arm bridges, 9: 4206
Neurospora
genetic and non genetic effects of x radiation on, 9: 475
survival and mutations in, following exposure to mixed radiations from nuclear explosions, 9: 826(J)
Neutrinos
angular correlation with electrons in β decay of Ne^{19}, 9: 2059(J)
anti-, detection of, from nuclear reactors by reaction Cl^{37} ($\bar{\nu}$,e^-), 9: 2921(J)
from carbon cycle in the sun, heat production in earth from, 9: 1916(J)
emission from A^{37}, observation with magnetic and electric deflection spectrometry, 9: 2078(J)
magnetic moment, 9: 1352(J)
magnetic moment of, calculations, 9: 2084(J)
recoil energies from emission in A^{37}, 9: 1067(R)
Neutron absorption cross sections
of boron, measurement, 9: 3284(J)
measurement in BEPO by pile oscillator method, 9: 694
Neutron activation analysis
(See Radiometric analysis.)
Neutron beams
production of high-energy, by bombardment of C with protons, deuterons, and He^3 particles, 9: 1993(J)
Neutron capture cross sections
measurement by capture-gamma counting, 9: 1073(J)
Neutron choppers
(See Neutron spectrometers.)
Neutron cross sections
measurement of, self-indicating technique for, 9: 988(R)
Neutron-diffraction analysis
modification of commercial x-ray goniometer for, 9: 2413
Neutron scattering cross sections
elastic, for 300-Mev neutrons on neutrons, 9: 2932(J)
elastic for, 380-Mev neutrons on protons, 9: 2492(J)
for excitation of low energy γ rays by inelastic scattering, 9: 4205(R)
neutron-deuteron differential angular cross sections, 9: 3995
Neutron shielding
(See also appropriate subheadings under devices shielded; are also Reactor shielding; Shielding.)
biological effectiveness, 9: 825(J), 826(J)
theory of neutron absorption in Doppler broadened resonances, 9: 1655
Neutron sources
catalog of, 9: 246(J)
design of pulsable, with Cockcroft-Walton accelerator, 9: 3307(J)
distribution of emergent neutrons, 9: 2931(J)
polonium, gamma spectra from, 9: 3929
preparation, remote-control equipment for, 9: 573(J)
of radium-beryllium, absolute intensity of, 9: 1063(J)
standard, calibrations of, comparison of, 9: 1064(J)
yield of Ra-Be, 9: 3985(J)

Neutron spectrometers

design, performance, and applications, 9: 2854

design of, for time-of-flight measurements, 9: 376

design of BNL neutron chopper, 9: 695

operation, 9: 297

time-of-flight for selection of cold neutrons, 9: 3601(J)

Neutron total cross sections

between 1 and 42 Mev with "strong-coupling" nuclear model, 9: 351(J)

comparison of, with proton total cross sections for light elements, 9: 358(J)

correction to exponential dependence of neutron transmissions in, 9: 4302(J)

Neutrons

(See also Cosmic neutrons; Delayed neutrons; Fast neutrons; Thermal neutrons.)

absorption and diffusion in infinite media, 9: 3676(J)

absorption by a small strongly absorbing rod, calculation, 9: 4265

absorption in bulk U, 9: 3712(J)

absorption of, in Doppler broadened resonances, theory, 9: 1655

age and slowing down in hydrogenous moderators, 9: 2927

angular distribution in (n,p) reactions, theory, 9: 2936(J)

angular distribution of, from B^{10} (d,n)C^{11}, 9: 407(J)

anomalous magnetic moment, 9: 3348(J)

from atomic explosion, late pathological effects on mice, 9: 21(J)

capture and scattering analysis in reactor cores, 9: 346(J)

collision with protons, neutral meson-deuteron production from, 9: 784(J)

detection and measurement, proportional survey meter for, 9: 306

detection and measurement and nuclear reactions, 9: 1991

detection and measurement by Ge crystals, 9: 1042

detection and measurement of, from proton synchrotron, 9: 2457

detection and measurement of, in reactors, design of ionization chamber for, 9: 3589

detection and measurement of, in the presence of large γ backgrounds, performance of scintillation detectors, 9: 3931(R)

detection and measurement of, instrument for, 9: 716(J)

detection and measurement of, performance of phosphors for, 9: 1601

detection and measurement of, with scintillation detectors, 9: 697

detection and measurement with BNL neutron chopper, 9: 695

detection and measurement with ionization chamber, 9: 318(J)

detection by standard and activated LiI phosphors, 9: 3947(J)

diffusion of, theory, 9: 347(J)

disordering of solids by, theory, 9: 4014(J)

distribution of, in nucleus, equations, 9: 456(J)

dosage determinations, 9: 3938

effect of orientation on induced activity of In foils, 9: 2857(J)

effects of high flux, on thermocouple calibration and thermocouple insulating materials, 9: 429

effects of total-body exposure to, on urine chemistry, 9: 2566(J)

effects on electrical properties of graphite, 9: 3328(J)

effects on x-ray lattice parameters and density of LiF crystals, 9: 1668(J)

elastic scattering, transformation theory, 9: 417(J)

elastic scattering of, by nuclei in motion, 9: 1115(J)

elastic scattering of 1.92 to 3.84 Mev, by carbon, 9: 3998(J)

energy-dependent albedo, 9: 4300

energy spectrum of, from nuclear reactor, 9: 1085(J)

exchange scattering of 380-Mev, on deuterons, 9: 3670(J)

group theory with application to inelastic scattering in U, 9: 3963

inelastic scattering in Fe, γ spectra from, 9: 419(J)

inelastic scattering in Li^7, 9: 3320(J)

inelastic scattering of, in Mn, 9: 3319(J)

Neutrons (cont'd)

interaction in magnetic materials, macroscopic aspects, 9: 1992(J)

interaction with deuterons, recoil deuterons and disintegration protons from, 9: 2939(J)

interactions with heavy and intermediate nuclei, comparison of experimental and theoretical results, 9: 386(J)

linear extrapolation length of, at surface of imperfectly absorbing cylinder, 9: 3997(J)

mass difference of protons and, 9: 732(J)

mass difference of protons and, by difference of electromagnetic self-energies, 9: 352(J)

mass difference theory, 9: 1078(J)

from Materials Testing Reactor, detection and measurement, 9: 2446

mean free path of slow, in nuclei near A = 150, 9: 4313(J)

migration area in water, 9: 774

Milne's problem with a point source, 9: 3709(J)

Monte Carlo evaluation of single scattering integrals, 9: 2926

optics and physical principles, 9: 2440(J)

penetration in H, 9: 1106

photoproduction in coincidence with protons, 9: 2331(R)

polarization, 9: 1067(R)

polarization and scattering by carbon, 9: 2481(J)

polarization in high-energy scattering, 9: 4311(J)

polarization of high-energy, by scattering from heavy nuclei, 9: 2042(J)

polarized, production and scattering of, from heavy nuclei, 9: 425(J)

polarized, Stern-Gerlach experiment on, 9: 1658(J)

produced by nuclear explosion or cyclotron, a comparison of biological effects on mice, 9: 825(J)

production by accelerated charged particles, survey of, 9: 1991

production by proton and deuteron reactions with Be and C, 9: 778

production by 2.2-bev protons on N and O, 9: 2922(J)

production from electron-bombarded uranium, 9: 3964

proton total cross sections of, at 208 and 315 Mev, 9: 358(J)

resonance absorption of U spheres, 9: 3713(J)

response of skin, 9: 2099(R)

scattering by deuterons, 9: 2037(J)

scattering by protons, radiation from, 9: 1376(J)

scattering in N^{14}, 9: 1384(J)

scattering of 14-Mev, by optical nuclear model, 9: 2474

scattering of 14.3-Mev, by He^4, 9: 2941(J)

scattering of 14.1 Mev, by protons, 9: 2939(J)

scattering of 91-Mev, by protons, 9: 1392(J)

scattering of, theory, 9: 2031

self-shielding factors for long hollow cylinders, 9: 2517(J)

single scattering in air, 9: 2028

slowing down of Ra-α-Be, in FeH_2O mixtures, 9: 1105

spatial distribution in H_2O and C from a fast neutron source, 9: 411(J)

spin of, from magnetic resonance experiment, 9: 1065(J)

from spontaneous fission of Cf^{252}, detection and measurement, 9: 2453(J)

thermal neutron contribution to fast neutron dose in mice, 9: 2547(R)

total scattering cross sections in crystals, interference effects, 9: 2048(J)

transmission, correction to exponential dependence of, 9: 4302(J)

transmission and multiplication in various elements, cross sections, 9: 3646(J)

two-group diffusion theory of, applied to reactors with reflectors, 9: 375(J)

Nevada (Clark Co.)

exploration of Erie and Arden Area, Goodsprings Mining District, Singer Mine, Vanadium Wedge Mine, and Old Dad Prospect in, 9: 1260(J)

Nevada (Esmeralda Co.)
uranium distribution in Rhyolitic Tuff Deposit in, 9: 1524(J)
Nevada (Humboldt Co.)
exploration of Virgin Valley Opal District in, 9: 1260(J)
Nevada (Lander Co.)
exploration of Austin Area in, 9: 1257(J)
Nevada (Lincoln Co.)
exploration of Atlanta Mine in, 9: 1260(J)
Nevada (Lyon Co.)
exploration of East Walker River Area in, 9: 1516
exploration of West Willys Claim, Silver Pick Property, and Yerington Property in, 9: 1260(J)
Nevada (Nye Co.)
exploration of Henebergh Tunnel Area and Daisy Fluorspar Mine in, 9: 1260(J)
Nevada (Pershing Co.)
exploration of Majuba Hill Mine and Stalin's Present Mine in, 9: 1260(J)
New Mexico
exploration of Datil Area in Catron, San Miguel and Socorro countries, 9: 955(J)
mineral association in U deposits, 9: 1829
trace elements reconnaissance in, 9: 2709
New Mexico (Sandoval Co.)
uranium bearing coal and carbonaceous shale in La Ventana Area in, 9: 2263
Nichrome
(See Nickel alloys.)
Nickel
absorption of β particles in, and relation to surface counting for diffusion measurements, 9: 4000(J)
chromatographic determination of, in soil samples, 9: 3404(J)
corrosion in water and aqueous media at 600 and 680°F, 9: 1822
corrosion of, by molten NaOH, effect of mass transfer on, 9: 951(J)
corrosion of, by wet and dry Cl_2 between 260 and 300°, 9: 158(J)
corrosion testing, methods for cleaning exposed specimens for, 9: 952(J)
creep tests on high-purity, 9: 1495(J)
deformed, point defects and release of energy, 9: 3535(J)
density of states curve for, 9: 231(R)
deposition of C and O films on foils of, heated with focused light from 1000-w electric lamp, 9: 242(J)
descaling methods for, corroded by high-temperature water, 9: 154
detection of plating of, through corrosion pits in Al sheaths by colorimetric spot tests, 9: 1196
determination in U by ion exchange, 9: 884(J)
determination in presence of Fe and Co with dimethylglyoxime, 9: 2167(J)
determination in U by ion exchange, 9: 1793(J)
determination of, in high-temperature alloys using anion-exchange separations, 9: 1544(J)
diffusion leak for regulating supply of H_2, 9: 3440(J)
diffusion of gases through, 9: 1577(J)
effects of H on, 9: 1272(J)
electrolytic polishing of, for removal of layers of Fe, 9: 3874
electron emission from, bombarded by hydrogen ions, 9: 250(J)
electroplating and roll-bonding to Ti, 9: 3477(R)
emission of secondary electrons (δ rays) by 1.3-Mev electron bombardment, 9: 1306(J)
extension of Matthiessen's Rule to cold-worked, 9: 1536(R)
film-surface area of evaporated, measurement, 9: 3887(J)
films, sorption of O_2 on, 9: 3112(J)
heat treatment, inspection, and testing of wrought, 9: 3194(J)
Nickel (cont'd)
mass transfer by liquid Na at 400 to 1000°F, 9: 4179(R)
neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)
neutron reactions (n,nγ), γ yields and energies from, 9: 4204(R)
oxidation of, effect of time, temperature, and surface treatment on, 9: 2306(J)
photometric determination of, with ethylenediaminetetraacetic acid, 9: 85(J)
photonuclear reactions, 9: 2449(J)
polarization of, in 3% NaCl solution, 9: 2259(J)
quantitative determination of divalent, using a high-frequency oscillator and ethylenediaminetetraacetic acid, 9: 2169(J)
radiochemical determination, 9: 876
range-velocity relation for fission fragments, 9: 1365(J)
self-diffusion, 9: 3886(J)
slow neutron cross sections, 9: 1391(J)
specific heat of, to 600°C, 9: 185
spectrographic determination in Bi, 9: 1475
spectrographic determination of, in ores and rocks, 9: 162
surface reactions, determined by field-emission microscopy, 9: 2741
thermal conductivity, 9: 989
thermal expansion, 9: 1266
x-ray spectra (soft), 9: 452(J)
Nickel alloys
casting and forging for gas turbine application, 9: 3869
corrosion by chlorinated and alkalized boiler water and pure deionized water, 9: 3168
corrosion in high-temperature waters, 9: 3459
corrosion in water and aqueous media at 600 and 680°F, 9: 1822
corrosion of grade "A," by alternate exposure to liquid and gaseous fluorine, 9: 4142
corrosion testing, methods for cleaning exposed specimens for, 9: 952(J)
creep, microstructure, rupture, and tensile properties, 9: 2273
creep and fatigue of, effects of grain size on, 9: 4184
descaling methods for, corroded by high-temperature water, 9: 154
enthalpy and reaction with fused NaOH, 9: 1466(R)
galling of Inconel, 9: 3843(R)
heat treatment, inspection, and testing of wrought, 9: 3194(J)
polarization of, in 3% NaCl solution, 9: 2259(J)
specific heat and enthalpy of Monel, 9: 2308(J)
Nickel aluminides
metallurgical properties, survey, 9: 3822(J)
Nickel–aluminum alloys
effects of Mo, $MoCl_2$ and Li on high-temperature strength, 9: 3485
microstructure, density, ductility, and stress-rupture, 9: 4166(R)
powder metallurgy and properties, 9: 3485
Nickel–aluminum–aluminum oxide systems
microstructure, density, ductility, and stress-rupture, 9: 4166(R)
Nickel–aluminum–chromium–titanium alloys
surface chemistry of oxidized, 9: 2747(J)
Nickel–aluminum–copper alloys
diffusionless phase transformation, crystal structure, heat treatment, and thermal expansion, 9: 1861(R)
Nickel–aluminum–titanium alloys
hardness, crystal structure, and phase studies, 9: 3520
preparation, sintering, density, resistivity, percent O_2, stress-rupture, and impact strength of hot-pressed, 9: 3165(R)
stress-ruptured of sintered, 9: 3850(R)

Nickel–aluminum–zirconium alloys

preparation, density, resistivity, stress-rupture, and transverse rupture strength of hot-pressed, 9: 3165(R)

Nickel–beryllium alloys

alloying effect of Be on properties of, 9: 982(J)

Nickel–boron–chromium systems

hardness measurements, 9: 3822(J)

properties of, as high-temperature brazing alloy for thin sheet metals, 9: 1886(J)

Nickel–calcium compounds (intermetallic)

crystal structure, 9: 683(J)

Nickel–carbon–titanium systems

microstructure and phase studies, 9: 3457

Nickel carbonyls

formation of, from Ni and Co, thermodynamics, 9: 3393(J)

heat capacity, heat of fusion, and melting point, 9: 3393(J)

Nickel–cerium compounds (intermetallic)

crystal structure, 9: 683(J)

Nickel chelates

with 2,4-pentanedione, formation constants, enthalpy, and entropy, 9: 3390(J)

Nickel–chromium alloys

constitution diagrams, Cr rich portion of, 9: 1876(J)

magnetization, theory and measurement, 9: 4209

oxidation at high temperatures, mechanism of, 9: 2325(J)

resistance sintering under pressure, 9: 1878(J)

specific heat and enthalpy, 9: 2308(J)

Nickel–chromium–cobalt alloys

static, fatigue, and mechanical properties of wrought N-155 alloy at elevated temperatures, 9: 4170

Nickel–chromium–cobalt–iron alloys

analysis of, using anion-exchange separations, 9: 1544(J)

weldability of wrought, 9: 3530(J)

Nickel–chromium–cobalt–tungsten alloys

preparation, fabrication, density, tensile properties, microstructure, hardness, and temperature effects of aged and sintered X-40 compacts, 9: 3173

weldability of wrought, 9: 3530(J)

Nickel–chromium–iron alloys

vacuum melting and casting, 9: 2727(R)

Nickel–chromium–iron–molybdenum alloys

tensile properties, creep-rupture at 1350 and 1500°F, and microstructure, 9: 3859

Nickel–chromium–molybdenum alloys

oxidation at 950°C, 9: 3146

weldability of wrought, 9: 3530(J)

Nickel–cobalt–molybdenum–tungsten alloys

compression-creep properties, 9: 3504(R)

compressive-stress-rupture properties of high temperature, 9: 3503(R)

Nickel–chromium steel

isothermal embrittlement in, during tempering from 800°F to lower critical temperature, 9: 4188

oxidation, 9: 949

Nickel coatings

porosity, determined by radioautographic inspection, 9: 147

on steel, corrosion and weldability of, 9: 171

Nickel–cobalt–uranium alloys

pseudo-binary phase sections between Laves phases in, 9: 3353(J)

Nickel complexes

with o-phenanthroline, sulfonated oxine, and naphthalenediamines, electrodeposition from aqueous solutions of, electronic configuration in, 9: 2625(J)

with 2-nitroso-1-naphthol-4-sulfonic acid, chemical properties, 9: 512

Nickel(II) complexes

with vic-dioximes, magnetic studies of, 9: 2155(J)

Nickel–copper alloys

corrosion by chlorinated and alkalized boiler water and pure deionized water, 9: 3168

corrosion in high-temperature waters, 9: 3459

magnetic and thermal properties, theory and measurement, 9: 4209

tensile properties of commercial and high-purity effect of temperature on, 9: 2309(J)

welded joints of, with stainless steel, thermal rupture, 9: 1264

Nickel–copper couples

diffusion in, effects on cross section area, 9: 3526(J)

diffusion processes in, 9: 4191(J)

Nickel crystals

effects of impurities and imperfections on the creep and hardness of, 9: 970

Nickel films

thin films, preparation and hexagonal structure, 9: 4088

Nickel(II) fluorides

crystal structure, 9: 92(J)

Nickel–germanium alloys

phase studies, 9: 3184(J)

Nickel–gold alloys

enthalpy change and strain energy in formation of solid solutions of, 9: 187

entropy, 9: 188(R)

entropy of solution for, measurements, 9: 1864(R)

Nickel hydrides

preparation of, by reaction with atomic H, 9: 635(R)

Nickel hydroxide–nickel couples

value of standard potential of $Ni-Ni(OH)_4$, 9: 2616(J)

Nickel hydroxides

oxidizing properties and decomposition of $Ni(OH)_4$, 9: 2616(J)

Nickel(II) ions

thermodynamic formation constants in aqueous solution for reaction of, with acetylacetonate at 30°C, 9: 1191(J)

Nickel–iron alloys

diffusionless phase transformation and crystal structure, 9: 1861(R)

magnetic properties, 9: 1067(R)

neutron diffraction studies of magnetic structure of, 9: 2312(J)

Nickel–iron–carbon systems

phase studies, 9: 2317(J)

Nickel–iron compounds (intermetallic)

superlattice formation of, in steady temperature annealing, 9: 2773(J)

Nickel–iron–molybdenum alloys

oxidation at 920 and 1110°C, 9: 3146

Nickel–iron–uranium alloys

pseudo-binary phase sections between Laves phases in, 9: 3353(J)

Nickel isotopes Ni^{59}

gamma emission, angular correlation of, 9: 1406(J)

gamma-gamma directional correlation function, 9: 3632(J)

lifetime for first excited state, upper limit of, 9: 1072(J)

lifetimes of two excited states of, upper limit to, 9: 2509(J)

Nickel isotopes Ni^{65} (cont'd)
nuclear spin, 9: 4204(R)
Nickel isotopes Ni^{63}
electrolytic separation of, 9: 289
radiometric determination of trace amounts of, in animal tissues, 9: 1156(R)
toxicology of, for rats, 9: 1156(R)
Nickel–lanthanum compounds (intermetallic)
crystal structure, 9: 683(J)
Nickel–manganese alloys
brittle failure of brazing wire containing 60% Mn, causes and prevention, 9: 4169
neutron diffraction studies of magnetic structure of, 9: 2312(J)
Nickel–manganese–molybdenum alloys
oxidation at 940°C, 9: 3146
Nickel–manganese–uranium alloys
pseudo-binary phase sections between Laves phases in, 9: 3353(J)
Nickel molybdates
crystal structure and x-ray-diffraction patterns, 9: 3146
phase transformation and spalling in, effect of oxide addition on, 9: 3146
Nickel–molybdenum alloys
oxidation kinetics, 9: 1274(J)
oxidation testing at 930, 940, and 945°C, 9: 3146
weldability of wrought, 9: 3530(J)
Nickel–nickel hydroxide couples
value of standard potential of $Ni-Ni(OH)_4$, 9: 2616(J)
Nickel oxides
heat and free energy of formation, 9: 529(J)
pyrolytic, activated adsorption of gases by, effect of free energy of the process of preparation on, 9: 65
reduction with hydrogen, kinetics of, 9: 2617(J)
single crystal neutron-diffraction study, 9: 2099(R)
slow neutron cross sections, 9: 1391(J)
Nickel–oxygen–titanium systems
phase studies, 9: 1874(J)
Nickel–platinum alloys
relaxation effects in solid solutions of, arising from changes in local order, 9: 204(J)
Nickel powders
heats of adsorption of N on, 9: 1789(R)
Nickel–silicon oxide systems
heats of adsorption of N on, 9: 1789(R)
Nickel–silicon systems
phase studies, 9: 3184(J)
Nickel steel
isothermal embrittlement in, during tempering from 800°F to lower critical temperature, 9: 4188
Nickel–tin alloys
surface tension, 9: 2702(R)
Nickel–titanium alloys
grain-boundary diffusion in, as bonding agent between Ti and steel, 9: 4182
Nickel–titanium carbide compacts
mechanical properties of, 9: 1820(R)
microstructure, effect of ball-milling, pressing, and sintering on, 2756(J)
vibratory compacting, 9: 4173(R)
Nickel–titanium compounds (intermetallic)
powder preparation, microstructure, and x-ray-diffraction patterns, 9: 3841(R)
Nickel–uranium alloys
preparation and properties, 9: 1431(P)
Nicotinamides
biosynthesis of, from 3-hydroxyanthranilic acid in rats, tracer study, 9: 124(J)
Nicotine
effects of, on CO_2 metabolism in rats, tracer study, 9: 2136(R)
Niobium
anhydrous separation of, by selective chlorination of partially hydrolyzed chlorides, 9: 908(J)
chromatographic determination of, in soil samples, 9: 3404(J)
colorimetric determination in presence of Ta, 9: 2176(J)
intermetallic compounds with Ir, Os, Pt, and Sn, preparation and structure, 9: 3878(J)
liquid–liquid extraction of, with hydrochloric acid from aliphatic ketone solutions, 9: 907(J)
neutron-diffraction studies of superconducting state, 9: 3218(J)
oxidation of, under conditions of linear temperature increase, 9: 182
polarographic behavior and determination of in H_2SO_4, 9: 538(J)
production of, by chlorination of Nb ores, 9: 1745
proton reactions (p,γ), 9: 1066(R)
radiochemical determination, 9: 876
separation from Ta, 9: 2666
separation of, by anion exchange, 9: 912(J)
spectrographic determination of, in ores and rocks, 9: 162
spectrophotometric determination of, in ores, 9: 3405(J)
spectrophotometric determination of, in steel, 9: 4080(J)
spectrophotometric determination of, in U ternary alloys, 9: 4074
Niobium–aluminum–titanium alloys
oxidation, 9: 3849(R)
Niobium borides
preparation by vacuum technique, 9: 1821(J)
Niobium carbides
preparation and phase studies, 9: 2148(J)
properties of, effect of molten Ti on, 9: 2247
Niobium–iron alloys
potassium carbonate fusion of, for production of Nb_2O_5, 9: 2666
Niobium isotopes Nb^{89}
decay scheme of Nb^{89m} and, 9: 2060(J)
nuclear properties, 9: 735
Niobium isotopes Nb^{90}
decay scheme, 9: 3341(J)
isomeric states from Mo^{90} decay, 9: 4328(J)
nuclear properties, 9: 735
Niobium isotopes Nb^{93}
nuclear resonance in $KNbO_3$, 9: 1351(J)
Niobium isotopes Nb^{94}
half life and β and γ emission, 9: 4016(J)
Niobium isotopes Nb^{95}
decay scheme, literature survey, 9: 2068(J)
energy levels, literature survey, 9: 2068(J)
Niobium–molybdenum alloys
creep-rupture strength of, 9: 633

Niobium ores

chlorination of, for production of Nb, 9: 1745

production of Nb_2O_5 from, by K_2CO_3 fusion, 9: 2666

Niobium oxides

band spectra of NbO, 9: 3798(J)

chlorination of, between 320 and 1000°C, 9: 1745

heat and free energy of formation, 9: 529(J)

production of Nb_2O_5 by K_2CO_3 fusion of Nb ores, 9: 2666

spectral analysis of the blue band system of, 9: 1227(J)

Niobium sulfides

x-ray studies of, 9: 887(J)

Niobium–titanium alloys

resistivity-temperature-concentration relationships of, 9: 1538(J)

Niobium–uranium alloys

determination of Sn and Zr in ternary, 9: 4074

Niobium–zirconium alloys

fabrication and phase studies, 9: 1530(R)

preferred orientation of β-annealed, 9: 189

Nitrates

(See also nitrates of specific elements; see also Ammonium nitrates; Uranyl nitrates.)

fused, electric conductivity, 9: 2139(J)

modification of DuPont nitrometer for determining, 9: 2640(J)

Nitric acid

concentration, pilot plant design, 9: 4058

effect of $NaNO_3$, KNO_3, and water additives on vapor tension and calorimetry of 100% and aqueous, 9: 2140(J)

kinetics of reactions with CO, NO, and H_2 and thermal decomposition, 9: 3051

partition between water and diethylether, methylisobutyl ketone, and dibutyl carbitol, 9: 3110(J)

polarization, corrosion, and erosion-corrosion of Al, Al–stainless couples, Al alloys, and stainless steels in fuming, design and performance of equipment for testing, 9: 2255(J)

reaction of, with Ti, accident report, 9: 3456(J)

Nitric acid–butyl phosphate systems

solvent properties of, for rare-earth nitrates, 9: 901

Nitric acid–butyl phosphate–uranyl nitrate systems

uranium solvent extraction from, performance of a louvre-plate redistributor for large-diameter pulse columns in, 9: 588(J)

Nitric acid–hydrofluoric acid systems

specific gravity and volumetric determination of hydrofluoric acid in, 9: 1202(J)

Nitric acid–nitrogen oxide systems

conductometric analysis, 9: 75

Nitric acid systems

corrosion of stainless steel in HNO_3–$K_2Cr_2O_7$ solutions, 9: 1885(J)

Nitrides

(See also nitrides of specific elements.)

preparation and x-ray-diffraction analysis of metallic, 9: 3380

Nitrites

fused, electric conductivity, 9: 2139(J)

modification of DuPont nitrometer for determining, 9: 2640(J)

Nitro compounds

effects on rate of catalytic exchange between D and acetic acid, 9: 2182(J)

Nitrogen

adsorption of, by fine particles, use as surface area determination, 9: 56(R)

Nitrogen (cont'd)

continuous detection and measurement of low concentrations of O_2 by dew-point method, 9: 2636(J)

determination by N^{14} (d,n)O^{15} reaction, 9: 2179(J)

diffusion in Ti, 9: 978(R), 2339(J)

effect on tensile properties of arc-deposited C steel weld metal, 9: 223(J)

effects of, on radioinduced chromosome aberrations in Tradescantia, 9: 3020(J)

effects on properties of Ti alloy welds, 9: 226(J)

electric breakdown processes in, 9: 2377(J)

energies of K transitions of π-mesonic x rays from, 9: 1909(J)

energy loss of positive ions single scattered in, 9: 1377(J)

excretion of, effects of total-body x irradiation on in rats, 9: 2568(J)

fabrication, heat treatment, and effect of microstructure on mechanical properties of, 9: 178

gas chromatographic elution of gases and volatile liquids from alumina, silica gel, or charcoal by, 9: 2672(J)

heat of adsorption on finely divided solids, experimental determination, 9: 1789(R)

heat of vaporization, calculated values of, 9: 1789(R)

interaction with cosmic radiation, production of Be^7, 9: 3655(J)

ion pair formation, 9: 4039(R)

ionic species formed by collision of gaseous ions in, 9: 1378(J)

ionization by α particles and fission fragments, 9: 2821

ionization yields, 9: 999(J)

isotopic content of atmospheric, in air and ocean water, 9: 662(J)

meter for determination of, calibration of, using gas mixtures of N_2, O_2, Co_2, and H_2O, 9: 877

neutron elastic scattering cross sections, 9: 1067(R)

proton total cross sections at 208 and 315 Mev, 9: 358(J)

purification and separation from A by hot metals, 9: 2382

reaction with Zr and diffusion in Zr at high temperatures, 9: 2145(J)

scattering of molecules from surfaces, 9: 650

semimicro determination in organic compounds, 9: 2166(J)

solidified, compressibilities at low temperature, 9: 2824(J)

specific ionization of, by high-energy electrons, 9: 3315(J)

thermal conductivity and viscosity of, from 0 to 600°C, 9: 2822

thermodynamic functions of, to 12,000°K, 9: 1896

tritium and neutron production from, by 2.2-bev protons, 9: 2922(J)

ultraviolet emission by α bombardment, 9: 3241(J)

virial coefficients, 9: 3081

Nitrogen (liquid)

solubility of H in, at 79 to 109°K and pressure to 190 atm., 9: 239(J)

solubility of He in, between 78 and 109°K and up to 295 atm., 9: 240(J)

thermal shielding properties, 9: 654

Nitrogen–aluminum–titanium systems

mechanical properties, 9: 3854(R)

Nitrogen–argon systems

filling of ion chambers with, advantages, 9: 3949(J)

Nitrogen–chromium–titanium systems

electrical resistance of films of, 9: 2345(J)

Nitrogen fixation

in nuclear reactors, 9: 3094(J)

Nitrogen fluorides

thermodynamic properties from 12° to 144°K, 9: 3413(J)

Nitrogen–hydrogen systems

phase studies, 9: 239(J)

Nitrogen–hydrogen–titanium systems
preparation and constitution diagrams, 9: 4187
Nitrogen ion beams (N^{14})
nuclear reactions in C^{12}, compared to proton reactions in Mg^{25}, 9: 1649(J)
Nitrogen ions
energy loss in gases of positive single scattered, 9: 1377(J)
ionic species formed in gases by collision with, 9: 1378(J)
range in Ilford C-2 emulsions, 9: 421(J)
Nitrogen–iron systems
size of interstitial solute atoms, lattice expansion, and electronic properties of close-packed, 9: 1780
surface tension, 9: 2702(R)
surface tension and wettability, measurements of, 9: 653(R)
Nitrogen isotopes
height and geographical distribution, 9: 2130
separation of, by ion exchange, 9: 3246(J)
Nitrogen isotopes N^{13}
beta decay and intermediate coupling, 9: 3625(J)
Nitrogen isotopes N^{14}
angular correlation between γ rays in $N^{14}(d,\alpha\gamma\gamma)C^{12}$ reaction, 9: 3659(J)
deuteron reactions (d,α), search for 15-mev γ rays from, 9: 769(J)
deuteron reactions (d,γ), energy and intensity of γ rays from, 9: 379(J)
deuteron reactions (d,p), 9: 1393(J), 1397(J)
deuteron reaction (d,p), angular distribution measurements, 9: 4205(R)
elastic scattering of 9.5-Mev protons, 9: 1389(J)
gamma reactions (γ,α) and excited states, 9: 1116(J)
isotopic effects on N metabolism in buckwheat, 9: 3(R)
neutron scattering, 9: 1384(J)
nuclear magnetic moment of, calculated by proton-neutron coupling, 9: 742(J)
nuclear quadrupole moment, 9: 2896(J)
Nitrogen isotopes N^{15}
energy levels, 9: 1393(J)
isotopic effects on N metabolism in buckwheat, 9: 3(R)
mass spectrometric determination, sample preparation, 9: 2180(J)
neutron scattering and nuclear properties, 9: 1067(R)
nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)
proton reactions (p,n), 9: 1067(R)
shift of the perpendicular bending frequency in KNO_3 and $NaNO_3$ due to, 9: 191(J)
Nitrogen isotopes N^{17}
photonuclear yields of, from O^{18}, F^{19}, Na^{23}, Al^{27}, Ne, and Mg, 9: 3644
Nitrogen–manganese–titanium systems
fabrication, heat treatment, phase studies, mechanical properties, microstructure, and aging characteristics, 9: 1856
phase studies and microstructure, 9: 1873(J)
Nitrogen mustards
effects of, on viscosity of alginates, 9: 2658(J)
effects of exposure to, on development of eggs of Habrobracon, 9: 3024(J)
Nitrogen oxide–nitric acid systems
conductometric analysis, 9: 75
Nitrogen oxides
atomic polarizations and dipole moments of, theory, 9: 2888(J)
formation of, during heliarc welding in atmosphere on N, 9: 629
heat and free energy of formation, 9: 529(J)
Nitrogen oxides (cont'd)
kinetics of reaction of nitric acid with NO, 9: 3051
microwave spectra, Zeeman shift in, 9: 1134(R)
microwave spectra and dielectric constants, 9: 342
reaction with thorium nitrate tetrahydrate, 9: 2234(J)
thermodynamic functions of, to 12,000°K, 9: 1896
toxicology, 9: 502(J), 503(J), 504(J)
toxicology of, formed during heliarc welding in N atmosphere, 9: 629
Nitrogen–oxygen systems
electric breakdown processes in, 9: 2377(J)
Nitrogen–titanium systems
constitution diagrams, 9: 2339(J)
mechanical properties of, effects of structure and composition on, 9: 201(J)
microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296
preparation, double inert-gas arc melting, forging, and welding, 9: 3489(R)
size of interstitial solute atoms, lattice expansion, and electronic properties of close-packed, 9: 1780(J)
Nitrogen–zirconium systems
size of interstitial solute atoms, lattice expansion, and electronic properties of close-packed, 9: 1780
Nitrometers
modification of DuPont, 9: 2640(J)
Nixon Fork Area (Alaska)
uranium distribution in, 9: 1523(J)
Noise
spectrum analyzer for scintillation detectors, 9: 1310(J)
Nomographs
for converting corrosion rates, 9: 2254(J)
for estimating energies of nuclear reactions, 9: 2916(J)
for obtaining rank correlation coefficient, 9: 2846(J)
for radioisotope buildup and decay, 9: 4021(J)
slide rule, for Co^{60} radiotherapy, 9: 3042(J)
Non-destructive testing
(See Materials testing.)
North Carolina Research Reactor
meteorological dispersal of stack gases from, 9: 3978
North Carolina State Coll.
progress reports on vibratory compacting of metal and ceramic powders, 9: 4173(R)
North Fork–Shoup District (Idaho)
exploration for U and Th deposits in, 9: 1520(J)
North Point No. 6 Area (Utah)
geophysical exploration, geology, mineralogy, and stratigraphy, 9: 1512
Northern Black Hills (S. Dak.)
exploration and U distribution, 9: 165(J)
Northern Black Hills (Wyo.)
exploration, 9: 1514(R)
Northwest Willys Group (Nev.)
exploration, geology, mineralogy, and U distribution, 9: 1516(J)
Nuclear batteries
(See also Photoelectric cells.)
design and development, 9: 348
design and performance, 9: 266, 3208(R)
design and performance of, using PbO_2 on stainless steel, 9: 267(R)
design of p-n junction, 9: 251(J)

Nuclear batteries (cont'd)

design, performance, and theoretical analysis, 9: 4226

design, performance, and theory, 9: 268(R)

developmental studied, 9: 3548(R), 3549(R), 3550(R),

performance of, as charger for ionization chambers, 9: 2825(R)

Nuclear electric moments

(See also Nuclear Magnetic moments.)

dipole transitions in nuclear photoeffect, calculation with independent-particle model, 9: 1995(J)

effect on angular correlations, 9: 3622

measurement from γ-γ angular correlations, 9: 1348(J)

quadrupole, of the deuteron, calculation with pseudoscalar meson theory, 9: 367(J)

quadrupole, spin-lattice relaxation in crystals due to, theory of, 9: 1012(J)

Nuclear emulsions

(See also Photographic emulsions; Photographic film; Photographic film detectors.)

alpha tracks in, 9: 3674(J)

apparatus for gap length measurement, 9: 1019

calculation of nuclear events by track analysis, 9: 1056(J)

correction of track length for grain density and background, 9: 1982(J)

detectors with stacked, construction of, 9: 1049(J)

developing techniques for α-p and α-t tracks in C-2 emulsions, 9: 2852

development of thick, with amidol in acid medium, 9: 720(J)

diffusion in the sensitive layers, 9: 2859(J)

distortion, 9: 2851

embedded wires in, to study specific nuclear interactions, 9: 1052(J)

fixing, 9: 319(J)

heavy-particle properties determined in, as functions of velocity, 9: 304

interaction of 17-Mev mesons, 9: 3616(J)

isothermal processing, 9: 3592(J)

mean free path of α particles, 9: 3966(R)

measurement of α particle tracks in, 9: 713(J)

measurement of cosmic neutrons below H_2O by, 9: 3946(J)

measurement of particle tracks by mean gap lengths, 9: 699

measurement of particle tracks in, by kinetic nucleography, 9: 712(J), 714(J)

meson and proton energy relations in, tables of, 9: 1557(J)

meson interactions in, 9: 777

microinterferometric examination of particle tracks in, 9: 2430(J)

microscopes for scanning, 9: 2853

multiple scattering measurements in, 9: 3325(J)

multiple scattering of protons in, 9: 2483(J)

particle track thickness of heavy nuclei, 9: 3598(J)

photoelectric counting apparatus, 9: 322(J)

photomeasurement of particle tracks in, 9: 709(J)

photometric analysis of particle tracks, 9: 3271

Polaroid Radiographic Packet No. 1001, evaluation of, for industrial radiography, 9: 143

porous structure of, and effect of hydrophilic liquids, 9: 3599(J)

"print-out" effects with dilute developer, 9: 2858(J)

range-energy relations for ions of charge greater than 2, 9: 408(J)

range-energy relations of protons and mesons in, 9: 3939(J)

range-energy relations of tritons in, up to 10 Mev, 9: 4250(J)

range of nitrogen ions in Ilford C-2, 9: 421(J)

range of 208-Mev protons in G5, 9: 3669(J)

range straggling and H blackening in, 9: 2890(R)

recoil tracks produced by 50- to 450-Mev protons, 9: 1569(J)

Nuclear emulsions (cont'd)

scattering angle of electrons from Bi^{210} in, 9: 715(J)

scattering constant for charged particles in, 9: 4303(J)

scattering of 160-Mev pions by protons in, 9: 1108

scattering of π mesons in, theory of, 9: 1142(J)

stopping of heavy negative mesons in, 9: 328(J)

tables for particle track measurements, 9: 4245

thick, procedures for preparing, for quick tracing of tracks, 9: 310(J)

track counting in solid angles, corrections for, 9: 1967(J)

wetting effect in, probability of nuclear events during, 9: 1294(J)

Nuclear engineering

Nuclear magnetic moments

(See also Nuclear electric moments.)

text on introductory, 9: 373(J), 374(J)

calculation of from j-j coupling, 9: 355(J)

of conjugate nuclei, 9: 3639(J)

correction terms in calculation, 9: 746(J)

of deuteron, calculation with pseudoscalar meson theory, 9: 367(J)

measurement from γ-γ angular correlations, 9: 1348(J)

measurement of, magnetic shielding effect in, 9: 3629(J)

octupole, of Ga^{69} and Ga^{71}, measurement, 9: 359(J)

Nuclear magnetic resonance

absorption theory, 9: 1628(J)

absorption theory, stochastic, 9: 1629(J)

apparatus for production of frequencies by, 9: 353

design and performance of spectrometer for quantitative analysis by, 9: 2678(J)

explanation of, in terms of nuclear spin exchange, 9: 3972(J)

gaussmeter for measuring, 9: 1618(J)

line shape of, effect of chemical shift and J coupling on, 9: 1636(J)

in liquids under high pressure, 9: 2011(J)

measurement of electronic susceptibilities by means of, 9: 3594(J)

measurement of, in liquids, 9: 286(J)

method for observing, 9: 2013(J)

proton, detection and measurement, 9: 366(J)

Nuclear models

alpha-particle, energy levels and nuclear radius of O^{16} from, 9: 357(J)

alpha-particle, energy levels of O^{16*} from, compared with levels from α reactions with C^{12}, 9: 418(J)

Bohr-Mottlelson and optical, study of, 9: 4205(R)

calculation of Li^8 binding energy using exponential type wave function with central Yukawa interaction, 9: 2442(J)

discussion of, 9: 3620(J)

excitation of heavy nuclei by low-energy protons, 9: 1071

fission processes according to various, 9: 3791(J)

independent-particle, calculation of electric dipole transitions in nuclear photoeffect, 9: 1995(J)

independent-particle, many parameter wave functions in, 9: 1695(J)

modifications to explain magnetic moments of conjugate nuclei, 9: 3639(J)

optical-potential complex square-well, adequacy of, for experimental results on neutron interactions with heavy and intermediate nuclei, 9: 386(J)

properties of, with inter-nucleon forces obeying Hooke's law, 9: 350(J)

representing meson fields as incompressible fluids with nucleonic sources confined to their interiors, 9: 1637(J)

review of recent studies, 9: 3631(J)

"strong-coupling," for description of scattering and compound nucleus formation in nuclear reactions, 9: 351(J)

theory, 9: 3638(J)

Nuclear models (cont'd)
theory of reduced width for collective, 9: 1690(J)
Nuclear models (collective)
deuteron stripping, interpretation by, 9: 3707(J)
dynamics of nuclear deformation by, 9: 2894(J)
Nuclear models (optical)
analysis of total and differential elastic scattering cross sections for high-energy nucleon scattering by nuclei, 9: 404(J)
applied to π-meson scattering by nuclei in nuclear emulsions, 9: 1142(J)
scattering of 14-Mev neutrons by, 9: 2474
Nuclear models (shell)
in analysis of γ transitions in (n,γ) reactions, utilization of, 9: 1360(J)
applied to nuclei with mass 19, 9: 4267(J)
conference on, 9: 3968
filling of, based on nucleon density in nucleus, calculation, 9: 356(J)
meson field theory for, from spin orbit coupling, 9: 3701(J)
relation to α decay, 9: 1999(J)
Nuclear particles
(See also Elementary particles; Nucleons; Radiation.
delayed disintegration of a heavy nuclear fragment, 9: 1005(J)
of spin 1, methods for specifying state of polarization of, 9: 4283(J)
Nuclear physics
annual report of Interuniversity Institute of Nuclear Sciences, 9: 2607(J), 2891(J)
book, "Annular Review of Nuclear Science", 1954, 9: 3967(J)
book on, 9: 4271(J)
books, 9: 1341(J), 2892(J)
recent developments in, 9: 349(J)
tables of nuclear data, 9: 3276(J)
Nuclear Physics Labs., Columbia Univ.
progress reports of Physics Div., 9: 3965(R)
Nuclear power
(See also Aircraft reactors; Power reactors.)
British program for development of, 9: 3356(J)
Britain's ten year plan, 9: 3715(J)
Canadian, bibliography, 9: 3003(J)
cost factors for Sodium Graphite Reactor, 9: 755(J)
cost factors in, 9: 1642(J)
economic aspects of, in Canada, 9: 3714
future aims in use of, 9: 470(J)
production and utilization, 9: 1701(J)
symposium on, for Australia, 9: 2102(J)
Nuclear power plants
cost factors and cycle analysis, 9: 2
gas turbine cycle study, 9: 3288
potential hazards from accidents involving, 9: 2912(J)
Nuclear quadrupole resonance
description, experiments, and experimental data, 9: 4332(R)
magnetic induction effects in, theory and measurement, 9: 3973(J)
Zeeman splitting of, 9: 1074(J)
Nuclear reactions
(See also Fission; Spallation; Thermonuclear reactions.)
comparison of N^{14} and proton induced reactions, 9: 1649(J)
concept of parentage of nuclear states in, 9: 3645(J)
Coulomb corrections and numerical results on (d,p) and (d,n) reactions, 9: 3658(J)
deuteron (d,p), numerical calculation of angular distributions, 9: 2095(J)
Nuclear reactions (cont'd)
deuteron stripping, interpretation by collective model, 9: 3707(J)
energies of, nomogram for estimating, 9: 2916(J)
energy distribution of products from, 9: 766(J)
excited nuclei from slow-neutron capture, explanation of existence of, 9: 1360(J)
formation of slow nucleons in, theory, 9: 3710(J)
gamma (γ,p) and (γ,n) cross section ratio, isotopic spin selection rules applied to, 9: 2450(J)
interpretation by correlation function, 9: 2915(J)
mass spectrographic analysis utilizing crossed electric and magnetic fields, 9: 4246
matrix elements in, 9: 1423(J)
neutron binding energies from (d,p) Q values, 9: 737(J)
proton polarization in (d,p) reactions, 9: 1647(J)
table of disintegration energies, 9: 794(J)
theory of the direct interaction in, 9: 2001(J)
transmutation, general description, 9: 3296(J)
Nuclear spectra
conference on, 9: 3968
Nuclear spin
(See also as subheading under specific isotopes.)
isotopic spin quantum number for light nuclei, validity of, 9: 1689
Nuclear structure
(See also Nuclear models.)
book, survey of nuclear species, 9: 3630(J)
calculation of, from j-j coupling, 9: 355(J)
discussion and review of current theory, 9: 2906(J)
distribution of nucleon densities and shell structure of nucleus, statistical analysis, 9: 356(J)
effects of, on probability of K capture, 9: 2088(J)
effects of finite nuclear size on bremsstrahlung production, 9: 3623(J)
excitation of heavy nuclei by low-energy protons, 9: 1071
nuclear radius from deuteron stripping measurements, 9: 1997(J)
nucleon displacement in nuclear ground state, determination of, from photon absorption, 9: 1079(J)
relation to thermal-neutron-capture gamma rays, 9: 3621(J)
review of recent studies, 9: 3631(J)
theory, 9: 3637(J), 3638(J)
Nuclear technology
handbook of new nuclear techniques, 9: 2893(J)
Nuclear theory
alpha decay theory and a surface well potential, 9: 1125(J)
charge independence for short-lived excited states, 9: 2993(J)
collision matrices for the compound nucleus, 9: 1996(J)
comparison of universal Fermi interaction with experiment, 9: 2530
consequences of charge independence in meson physics, 9: 2529
coupled meson and nucleon fields, lattice space quantization, 9: 2992
current status of meson theory, 9: 1140
effects of nuclear charge on internally produced pairs, 9: 1076(J)
effects of oscillation of the meson shell of nucleons on probability of particle interactions, 9: 456(J)
evaporation of nucleons from nuclei, 9: 2003(J)
evidence for two-body spin-orbit forces in, 9: 1077(J)
fourth-order corrections to meson-nucleon scattering in pseudoscalar meson theory, 9: 1662(J)
influence of relativistic terms in meson theory of nuclear forces, 9: 2085(J)
matrix elements in superallowed transitions, 9: 2997(J)
meson processes for photoproduction of π^0 meson from D_2 and He, 9: 1344(J)

Nuclear theory (cont'd)

negative proton production and annihilation, 9: 1345(J)

neutron level width and density of energy levels, relation between, 9: 1070(J)

nuclear binding energy and two-body force, 9: 466(J)

nuclear photoeffect, effect of nuclear compressibility on, 9: 1141(J)

nucleon anomalous moment in a cut-off meson theory, 9: 3348(J)

nucleon Green function in charged, 9: 3708(J)

particle derivation of nuclear rotation properties associated with a surface wave, 9: 1075(J)

pseudoscalar coupling in, effect on single and double pion production, 9: 723(J)

pseudoscalar meson, calculation of nuclear magnetic and electric quadrupole moments with, 9: 367(J)

pseudoscalar meson interactions for systems with spin greater than ½, 9: 2996(J)

pseudoscalar meson theory, 9: 1144(J), 2527

pseudoscalar with pseudoscalar coupling, dissociation parameter, 9: 2089(J)

pseudoscalar with pseudovector coupling, divergences in, 9: 2090(J)

saturation of nuclear force by meson-meson interaction, 9: 337(J)

shell structure, 9: 1640(J)

spin-orbit coupling and mesonic Lamb shift in, 9: 3701(J)

statistical, 9: 2000(J)

statistical factors in nuclear electromagnetic transitions, 9: 812

Tamm-Dancoff methods and nuclear forces, 9: 1696(J)

two-body forces and nuclear saturation, 9: 462

Nuclei

(See also subheadings under specific elements and isotopes for nuclear properties and reactions.)

absorption of π mesons by heavy, 9: 1385(J)

alignment of, electric hfs method for, experimental and theoretical considerations, 9: 365(J)

alpha disintegration energy for heavy, formula, 9: 3692(J)

alpha-γ directional correlations, increased efficiency with liquid film sources, 9: 321(J)

average potentials and densities, 9: 4269(J)

charge, effect on internally produced pairs, 9: 1076(J)

collision of high-energy mesons, protons, and α particles, 9: 1667(J)

Coulomb excitation, 9: 1067(R)

disintegration energies, table, 9: 794(J)

elastic scattering of neutrons by moving, 9: 1115(J)

elastic scattering of nucleons by, theory of polarization, 9: 3314(J)

electron scattering by polarized, 9: 2049(J)

energy bonds of, review, 9: 744(J)

energy levels of light nuclei from He^5 to Ne^{23}, 9: 3628(J)

evaporation of nucleons from, 9: 2003(J)

even-even, characteristics of second excited states in region $36 \leq N \leq 88$, 9: 4270(J)

excitation of heavy, by low-energy protons, 9: 1071

excited by monoenergetic protons, emission of α particles from, 9: 2917(J)

excited states of even-even, 9: 1638(J)

evidence for two-body spin-orbit forces in, 9: 1077(J)

gamma absorption, 9: 4006(J)

gamma transition lifetimes, measurement by recoil methods, 9: 2877(J)

half life for low activities of short-lived, calculation, 9: 4022(J)

half life of radioactive, determinations with small samples, 9: 4331(J)

heavy, production and scattering of polarized neutrons from, 9: 425(J)

inelastic electron scattering by, nuclear multipole transitions in, 9: 785(J)

Nuclei (cont'd)

intermediate and heavy, comparison of experimental and theoretical results on neutron interaction with, 9: 386(J)

isobaric spins and congruent states, review, 9: 1998(J)

isobaric states, application to meson photoproduction, 9: 2883(J)

low-lying states of spin 1- in even-even, 9: 1633(J)

magnetic moments and configuration mixing of odd, 9: 3634(J)

magnetic shielding of, in molecules by a variational method, 9: 3629(J)

masses of light, tables, 9: 3277(J)

mean free path of slow neutrons in, near A = 150, 9: 4313(J)

μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)

meson scattering by, magnetic effects, 9: 1109(J)

microwave spectroscopy, review, 9: 3971(J)

multiple Coulomb scattering from extended, 9: 775

neutron binding energies of, determined from (d,p) Q values, 9: 737(J)

neutron resonance width variations, 9: 4039(R)

neutron scattering, polarization at high energies, 9: 4311(J)

neutron widths and density of levels, relation between, 9: 1070(J)

nuclear magnetic moment, correction terms in calculation, 9: 746(J)

nucleon-nucleus potential at high energies, 9: 3618(J)

odd-odd, nuclear magnetic moment of, calculated by proton-neutron coupling, 9: 742(J)

oscillation of, calculation of, by Thomas-Fermi method, 9: 457(J)

photon absorption by, harmonic mean energy for, 9: 1079(J)

polarization by electron resonance saturation, 9: 1635(J)

polarization by microwaves, 9: 3971(J)

polarization in nucleon scattering by complex, 9: 3316(J)

polarization of nucleons elastically scattered from, 9: 3680(J)

properties, conference on, 9: 3968

reduced width of energy levels in, theory, 9: 1690(J)

resonance of protons in liquid molecules, 9: 1639(J)

resonance scattering of γ rays by, 9: 783(J)

scattering of fast neutrons and protons by, 9: 3681(J)

scattering of high-energy electrons and positrons by, 9: 3671(J)

scattering of 340-Mev protons by subshells in light, 9: 2444(J)

self-conjugate, gamma reactions (γ,p) and (γ,n), yield ratios, 9: 3300(J)

self-consistent fields for, equations for, by calculation of electrostatic force, 9: 456(J)

shell theory for, with A = 19, 9: 4267(J)

spin coupling of, effects of perturbing r-f fields on, 9: 3636(J)

surface energy and diffuseness of nuclear surface, 9: 4268(J)

table of α-decay energies for heavy, 9: 806(J)

theory of shell structure, 9: 1640(J)

theory of the direct interaction in reactions of, 9: 2001(J)

total and differential elastic scattering cross sections for high-energy nucleons, optical-model analysis of, 9: 404(J)

wave numbers of Kα satellites in, from Z = 19 to 42, 9: 4341(J)

Nucleic acids

of carcinoma cell suspensions, effects of radiation, 9: 1718(J)

coliphage, linkage of glucose in, 9: 870(J)

incorporation of adenine into, effects of tumor growth, x radiation, and 8-azaguanine on, in mice, 9: 1449(J)

incorporation of adenine into, tracer study, 9: 2608, 3377

incorporation of formate into components of, effects of infected bone marrow in rats, tracer study, 9: 1176

of thymic cells, effects of irradiation on, in mice, 9: 2558(J)

Nucleon showers
penetrating, production in Li, C, Al, and Pb, 9: 1926(J)

Nucleons
(See also Neutrons, Protons.)
absorption reaction of fast charged hyperon with, 9: 3611(J)
collision of, production of mesons by, 9: 1338(J)
collisions with pions, γ rays from, 9: 2032(J)
collisions with pions, multiple production of pions from, 9: 793(J)
density distribution of, in nucleus, calculation, 9: 356(J)
elastic scattering by nuclei, theory of polarization, 9: 3314(J)
gamma scattering by, calculation of cross section for, 9: 426(J)
interaction coupling theory with mesons, 9: 1630(J)
interaction of, with mesons, S matrix for, 9: 335(J)
interaction with mesons, theory, 9: 330(J)
interactions of cosmic radiation underground with, cross sections for, 9: 1006(J)
interactions of free, theory, 9: 2091(J)
interactions with mesons, Λ° production from, 9: 1986(J)
interactions with π mesons, approximate treatment, 9: 2083(J)
interactions with π mesons, review in Annual Review of Nuclear Science, 9: 4008(J)
magnetic moments, Sachs' theorem on, 9: 3706(J)
mass difference theory, 9: 1078(J)
meson production by proton collisions, 9: 1069(J)
meson-nucleon scattering S matrix expressed in Heisenberg representation for, 9: 3704(J)
meson scattering and photomeson production, 9: 2044(J)
nuclear total scattering cross sections for, theory, 9: 3673(J)
nucleon-nucleus potential at high energies, 9: 3618(J)
phase shifts for nucleon-nucleon scattering at 280 Mev, 9: 788(J)
photon scattering by, calculation of cross section from experimental photomeson production cross section, 9: 405(J)
polarization in nucleon-nucleon scattering, formula, 9: 786(J)
polarization in scattering by complex nuclei, 9: 3316(J)
polarization of elastically scattered, 9: 2099(R)
polarization of, elastically scattered from nuclei, 9: 3680(J)
scattering by antinucleons, cross sections and vacuum polarization of, 9: 1661(J)
scattering by mesons, fourth-order corrections to, in pseudoscalar meson theory, 9: 1662(J)
scattering by nucleons, amplitudes in, 9: 3312(J)
scattering by nucleons, polarization and amplitudes in, 9: 3313(J)
scattering by pions, theoretical analysis of, 9: 403(J)
scattering of fast, by nuclei, 9: 3681(J)
scattering of π mesons by, calculations, 9: 329(J)
scattering of π mesons by, theory, 9: 722(J)
scattering of polarized beams of, 9: 4304(J)
slow, formation in nuclear reactions, 9: 3710(J)
spin orbit coupling in pseudoscalar meson fields, theoretical determination, 9: 3701(J)
strong coupling with meson fields, theory, 9: 1421(J)
tensor forces dependent on velocity of, 9: 815(J)
total and differential elastic scattering cross sections for high-energy, by nuclei, optical-model analysis of, 9: 404(J)

O

Oak Ridge National Lab.
progress reports of Mathematics Panel, 9: 2845(R)
progress reports of the Physics Div., 9: 1067(R)

Octanoic acid
(See Caprylic acid.)

Octic acid
(See Caprylic acid.)

Ohmart Corp.
progress reports on development of nuclear batteries, 9: 3548(R), 3549(R), 3550(R)

Oil deposits (Kan.)
radioactivity in, 9: 1517(J)

Oiler Tunnel (Utah)
mineralogy, 9: 1829

Old Dad Prospect (Nev.)
thorium and U distribution, 9: 1260(J)

Onions
effects of γ radiation on storage life, 9: 3735(J)

Optical systems
(See also specific instruments, e.g., Microscopes.)
for adjustment of the skin distance for in vivo measurements of radioactive isotopes, design, 9: 688(J)
design of, for use in photometer, 9: 4215
method for bonding optical glass parts to metal mounts, 9: 4123

Orange Hill (Alaska)
geology, 9: 626(J)

Oregon State Coll.
progress reports on the luminescence of alkali halides by heavy metals, 9: 1784(R)

Ores
(See also specific minerals, e.g., Monazites; see also specific ores, Thorium ores; see also Minerals.)
flotation of, review, 9: 3161(J)
paper chromatographic determination of trace metals in geochemical prospecting of, 9: 2264(J)
spectrographic analysis of, for minor elements, 9: 162
spectrophotometric analysis of, for Nb, Ta, and Ti, 9: 3405(J)

Organic acids
(See also specific organic acids.)
radiation decomposition of, 9: 102

Organic compounds
chemical reactions, review, 9: 3062(J)
heat transfer coefficient measurement of, design of apparatus for, 9: 3132(J)
labeled, catalog of, 9: 246(J)
phosphorescence of, effects of structure on, 9: 3759(R)
semimicro determination of F, Cl, and N in, 9: 2166(J)
of sulfur, volumetric microdetermination of S in, 9: 80(J)
radiation decomposition of, 9: 102
suitability for radiochemical operations, effects of corrosive atmospheres, temperature variables and radiation on, 9: 107

Organic compounds, metallo-
of fluorine, chemistry of, 9: 893(J)
thermal decomposition, 9: 3805(R)

ORNL reactors
(See Bulk Shielding Facility; Homogeneous Reactor Experiment; Homogeneous Reactor Test; Materials Testing Reactor Mockup.)

Oscillators
design, 9: 1579(R)
frequency and circuits for synchrotrons, 9: 392
nuclear magnetic resonance apparatus for production of frequencies, 9: 353

Oscillographs

photoelectric comparator for measuring oscillograms, 9: 279(J)

recording, design and performance of, for the mμsec region, 9: 269

Osmium

determination of, as sulfide, 9: 82(J)

intermetallic compound with Nb, preparation and structure, 9: 3878(J)

natural radioactivity, 9: 804(J)

Osmium fluorides

preparation of complex, 9: 2188(J)

Osmium isotopes Os^{192}

energy levels and γ spectra, 9: 4333

Osmium chelates

preparation and chemical properties, 9: 512

with bypyridine, chemical properties, 9: 512

Osmium isotopes

Szilard-Chalmers concentration, 9: 1959(J)

Osmosis

electro-, in paper electrochromatography with electrode vessels, 9: 1220(J)

electro-, of lactic acid solutions in paper electrochromatography with electrodes on paper, 9: 1221(J)

Ovaries

(See Gonads.)

Ovens

(See also Furnaces; Kilns.)

single crystal temperature controlled, for x-ray spectrometer, design, 9: 1028(J)

1,3,4-Oxadiazoles, 2,5-diaryl-

preparation, 9: 3773(J)

Oxazoles, 2,5-diaryl-

preparation, 9: 3773(J)

Oxidation

(See also High-temperature oxidation.)

design and performance of equipment for, of sphalerite, 9: 3381

of high-purity nickel, effect of time, temperature, and surface treatment on, 9: 2306(J)

isotope effect of O^{18} in, of copper, 9: 850

of metals and alloys, review, 9: 3206(J)

radioinduced, 9: 1215(J)

radioinduced, asymmetry of action of H and OH radicals in, 9: 1216(J)

Oxide coatings

(See also specific oxide coatings.)

on aluminum alloys, effects on properties, 9: 3519

Oxide films

examination by reflection electron microscopy, 9: 3536(J)

formation kinetics of, on metals, 9: 638

formation on Cr and Cr–Ni steels, x-ray diffraction analysis, structure, and properties, 9: 949

Oxides

(See also specific oxides.)

double, of transition metals, preparation and fluorite structures of, 9: 857(J)

energy loss of 22-kev electrons, 9: 1665(J)

heat and free energy of formation of metal, 9: 529(J)

Oxime complexes

with nickel(II) and palladium(II), magnetic studies of, 9: 2155(J)

Oxyfluorides

preparation of metallic, 9: 1426(P)

Oxygen

activated adsorption on pyrolytic nickelous oxide, 9: 65

chemical determination in Ca, 9: 3070

chemisorption on UO_2–ThO_2 solid solutions, 9: 603(J)

combustion determination of, in Ti and Ti alloys, 9: 1197

content in Na and NaK in Ni and stainless steel loops from 200 to 1000°F, 9: 4179(R)

continuous detection and measurement of low concentrations of, in N_2, He, and A by dew-point method, 9: 2636(J)

depolarization, in metal corrosion, 9: 4143(J)

design and performance of apparatus for continuous detection and measurement of low concentrations of, in gases by dew-point method, 9: 2636(J)

determination of, 9: 52

determination of, O_2-enriched air, survey of methods, 9: 77

diffusion of, in Ti, 9: 2339(J)

disintegration by 300-Mev neutrons, 9: 2890(R)

effects of, on radiation injuries in seed of barley, 9: 2593(J)

effects of, on radioinduced chromosome aberrations in Tradescantia, 9: 3020(J)

effects on corrosion of metals in NaK, 9: 4179(R)

effects on frequency of x-ray induced mutations in eggs of Habrobracon, 9: 2592(J)

effects on mass transfer of stainless steel components in liquid Na at 925°F, 9: 3827

effects on properties of Ti alloy welds, 9: 226(J)

electric breakdown processes in, 9: 2377(J)

electrochemical determination of traces of, in nitrogen or other gases, 9: 2631

energies of K transitions of π-mesonic x rays from, 9: 1909(J)

heat of vaporization, calculated values of, 9: 1789

high-tension, effects on development of pupae of Habrobracon, 9: 1729(J)

interaction with clean metal surfaces, 9: 2159(J)

ion pair formation, 9: 4039(R)

isotopic content of atmospheric, in air and ocean water, 9: 662(J)

isotopic equilibration determination of, in O systems of Cu, Fe, Cr, Ti, and oxides of Cu, Fe, and Zr, 9: 3394

isotopic exchange reaction between molecular and atomic, 9: 860(J)

magnetic scattering of slow neutrons from molecular gaseous, 9: 2487(J)

μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)

neutron total cross section at high energies, 9: 4004(J)

neutron total cross sections, 9: 1107

nuclear disintegration of, by neutrons, 9: 378

nucleon total scattering cross sections, 9: 3673(J)

photochemical reactions, 9: 2612

preparation of radiation targets of NiO by heating Ni foils in presence of, 9: 242(J)

proton total cross sections, 9: 2458

proton total cross sections at 208 and 315 Mev, 9: 358(J)

recombination, from homogeneous reactors, 9: 754(J)

separation from A and N by hot metals, 9: 2382

separation of Ti from, by vacuum sublimation, 9: 2209(J)

sorption on evaporated Ni films, 9: 3112(J)

transfer of, between CO_2 and CO in presence of different carbons from 650 to 900°C, 9: 526(J)

tritium and neutron production from, by 2.2-bev protons, 9: 2922(J)

ultraviolet emission by α bombardment, 9: 3241(J)

virial coefficients, 9: 3081

Oxygen–aluminum–titanium systems
effects of heat treatment on elevated-temperature tensile properties and microstructure, 9: 2719(R)
mechanical properties, 9: 3854(R)
Oxygen–carbon–titanium systems
mechanical properties, microstructure, and phase studies, 9: 1870(J)
Oxygen–chromium systems
isotopic equilibration determination of O in, 9: 3394
Oxygen–chromium–titanium systems
phase studies, 9: 1874(J)
Oxygen–copper systems
isotopic equilibration determination of O in, 9: 3394
Oxygen–iron systems
isotopic equilibration determination of O in, 9: 3394
surface tension, 9: 2702(R)
Oxygen–iron–titanium systems
phase studies, 9: 1874(J)
Oxygen isotopes
height and geographical distribution, 9: 2130
thermonuclear reactions of protons with, in stars, 9: 3647(J)
Oxygen isotopes O^{15}
decay and half lives, 9: 1880(J)
half life, 9: 2951
Oxygen isotopes O^{16}
deuteron reactions (d,p), 9: 1393(J)
deuteron reactions (d,p) at 0.60 to 1.45 Mev, angular distributions, 9: 4293(J)
energy levels, 9: 1349(J)
energy levels and nuclear radius of, from α-particle model, 9: 357(J)
energy levels from α bombardment of C^{12} compared with predicted levels from α-particle nuclear model, 9: 418(J)
gamma reactions (γ,α) and excited states, 9: 1116(J)
gamma reactions $(\gamma,n\alpha)$ and (γ,t), 9: 3674(J)
gamma reactions (γ,p) and (γ,n), yield ratios, 9: 3300(J)
half lives of excited states, measurement, 9: 2877(J)
triton reactions (t,n), excitation function for, 9: 2016
Oxygen isotopes O^{17}
deuteron reactions (d,α), Q values and α spectra of, 9: 1361(J)
deuteron reactions (d,p), magnetic analysis of, 9: 1088(J)
energy levels, 9: 1393(J)
nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)
Oxygen isotopes O^{18}
abundance in fresh water, 9: 1952(J)
concentration in water of crystallization, temperature effects, 9: 2267(J)
deuteron reactions (d,p), proton groups and Q values of, 9: 1087(J)
gamma reactions (γ,p), N^{17} yield curve from, 9: 3644
isotope effect in oxidation of copper, 9: 850
Oxygen isotopes O^{19}
beta decay, F^{19} assignments from, 9: 363(J)
shell theory for, and other A = 19, 9: 4267(J)
Oxygen–manganese–tantalum systems
metallic ternary phases in, 9: 3185(J)
Oxygen–nickel–titanium systems
phase studies, 9: 1874
Oxygen–nitrogen systems
electric breakdown processes in, 9: 2377(J)
Oxygen–phosphorus–titanium systems
metallic phases in, 9: 858(J)
Oxygen–phosphorus–zirconium systems
metallic phases in, 9: 858(J)
Oxygen–titanium systems
constitution diagrams, 9: 2339(J)
creep deformation of, 9: 175(R)
evaporation rate of, 9: 2209(J)
fabrication, heat treatment, and effect of microstructure on mechanical properties of, 9: 178
isotopic equilibration determination of O in, 9: 3394
preparation, double inert-gas arc melting, forging, and welding, 9: 3489(R)
size of interstitial solute atoms, lattice expansion, and electronic properties of close-packed, 9: 1780(J)
vapor-solid equilibria in, 9: 2772(J)
Oxygen–zirconium systems
isotopic equilibration determination of O in, 9: 3394
size of interstitial solute atoms, lattice expansion and electronic properties of close-packed, 9: 1780(J)
Ozone
heat and free energy of formation, 9: 529(J)

P

Packed columns
heat transfer in cross-flow, equations for penetration of heat or solutes, 9: 140(J)
pulsed, calculation of pulse amplitude, 9: 3790
Pahasapa Limestone (S. Dak.)
geology of, 9: 165(J)
Painted Desert Area (Ariz.)
airborne radioactivity survey of, geophysical investigations map, 9: 2268(J)
Pair production
accompanying β transitions of nuclei, theory, 9: 4205(R)
effects of nuclear charge on internally produced pairs, 9: 1076(J)
in electron field at very low and very high energies, 9: 1937(J)
review on, in Annual Review of Nuclear Science, 9: 4007(J)
Paleotemperatures
concentration of O^{18} in water of crystallization, application to, 9: 2267(J)
Palladium
adsorption of O_2 and CO on evaporated films of, 9: 2159(J)
coulomb excitation, 9: 1066(R)
determination of, as sulfide, 9: 82(J)
permeability to H_2, 9: 969
radiochemical determination, 9: 876
Palladium(II) complexes
with vic-dioximes, magnetic studies of, 9: 2155(J)
Palladium–copper alloys
constitution diagrams, crystal structure, heat treatment, physical properties, and preparation, 9: 3174
Palladium isotopes
electric excitation energy levels and pulse height spectra, 9: 4205(R)
Szilard-Chalmers concentration, 9: 1959(J)
Palladium isotopes Pd^{103}
decay scheme, 9: 1408(J)
disintegration, 9: 2970(J)

Palladium isotopes Pd^{104}

lifetime of first excited state, upper limit of, 9: 1072(J)

Palladium isotopes Pd^{112}

beta and gamma decay, 9: 4018(J)

Palladium–molybdenum couples

development of, for high-temperature measurements, 9: 185

Paper

(See also Filter papers.)

basis-weight determinations for, performance of a comparator for, 9: 307(J)

Paradox Quadrangle (Colo.)

mineral investigations field studies map of, 9: 4151(J)

Paraffin

cosmic shower production in, 9: 2814(J)

slowing down of polarized protons by, 9: 2039(J)

Paramecium

effects of x radiation on, 9: 3014(J)

growth, 9: 2547(R)

Particle collectors

(See also Electrostatic precipitators; Filters.)

conifuge, design and performance, 9: 4041

design of, for radioactive dusts, 9: 1802

performance, 9: 3720(R)

for sampling dusts, evaluation, 9: 935

for sampling of radioactive dusts, design, 9: 1798(R), 1799(R), 1800(R)

for sampling radioactive dusts, design and performance, 9: 1801(R)

Particle microscopes

(Non-optical microscope using ions other than electrons; see also Electron microscopes.)

design of Li ion, 9: 1950(J)

Particle tracks

(See also Photographic film; Photographic film detectors.)

apparatus for gap length measurement in nuclear emulsions, 9: 1019

analysis and counting of, 9: 1056(J)

average gap length between exposed grains, measurement, 9: 2414

in cloud chambers, method for estimating disortion of, 9: 2421(J)

correction of length, for grain density and background, 9: 1982(J)

discrimination of α-p and α-t, in C-2 emulsions, 9: 2852

measurement in distorted nuclear emulsions, 9: 2851

measurement in nuclear emulsions by mean gap lengths, 9: 699

microinterferometric examination of, in nuclear emulsions, 9: 2430(J)

quick tracing in thick nuclear emulsions, procedures and equipment to improve, 9: 310(J)

thickness of, of heavy nuclei, 9: 3598(J)

Particle trajectories

analysis of, in linear accelerators, 9: 3988

Particles

(See also headings such as Nickel powders; see also Aerosols; Charged particles; Cosmic particles; Dusts; Elementary particles; Nuclear particles; Powders.)

counting, design of a photometer for, 9: 4215

determination of specific surface of sieve-size powders, methods, 9: 2622(J)

electric properties, effect on aggregation, 9: 3904(R)

pulmonary absorption of, in rats and dogs, 9: 3360

screening of, in centrifugal elutricator, 9: 623(R)

Particles (cont'd)

size and counting measurement techniques, 9: 253(J)

size measurement, equipment, 9: 3720(R)

size measurement of, in fission product aerosols, 9: 819

size measurement of, performance of conifuge for, 9: 4041

surface area measurements of, by turbidimetric methods, 9: 623(R)

surface area determination by adsorption of N_2 at low temperatures by, 9: 56(R)

in very fine powders, size measurement, 9: 1291(J)

Pegmatite deposits (Colo.)

mineralogy, 9: 4156(J)

occurrence in Crystal Mountain District and mineralogy of, 9: 3157(J)

Penn Haven Junction (Penna.)

exploration, geology, and U distribution, 9: 164(J)

Pennsylvania (Carbon Co.)

exploration, geology, and U distribution, 9: 164(J)

Pennsylvania State Coll. Mineral Industries

progress reports on refractory materials for high-temperature areas of aircraft, 9: 3844(R)

Pennsylvania State Coll. School of Mineral Industries Experiment Station

progress reports on investigation of mineralogy, petrography, and paleobotany of U-bearing shales and lignites, 9: 621(R), 622(R), 1511(R), 1826(R), 1827(R), 3461(R), 3462(R)

Pentaerythritol tetranitrate

detonation velocities of, 9: 3214

2,4-Pentanedione

chelates with Be, Cd, Ce, Co, Cu, Mg, Mn, Ni, UO_2^{2+}, and Zn, formation constants, enthalpy, and entropy, 9: 3390(J)

ions, equilibrium, formation constants of Mg^{++}, Cd^{++}, Mn^{++}, Fe^{++}, Co^{++}, UO_2^{++} and Cu^{++} with, in aqueous solution, 9: 1752(J)

2,4-Pentanedione ions

thermodynamic formation constants in aqueous solution for reactions of Zr^{++}, Ni^{++}, Ce^{+3}, Pr^{+3} with, at 30°C, 9: 1191(J)

2-Pentanone, 4-methyl-

distillation and spectrophotometric determination of, in aqueous U solutions, 9: 533

Peptides

acetylation of, by ethyl thioltrifluoroacetate in aqueous solution, 9: 123

Perchlorate ions

conductometric determination in alkali metals by paper chromatography, design and performance of apparatus for, 9: 2215(J)

Perchloric acid

atomic hydrogen hyperfine structure in, 9: 1687(J)

hood scrubber unit for, design, 9: 932

neutralization titrations of, in anhydrous pyridine, 9: 882(J)

potentiometric titration of, in formic acid with an H electrode, 9: 523(J)

Perfluoroörganic compounds

(With specific organic compounds, the standard numerical prefixes or the general term Fluoro- are used instead of the term Perfluoro-.)

solvent properties of, for I_2, SnI_4, and phenanthrene, 9: 95(J)

synthesis by fluorination of dimethyl-substituted fluoranthene and physical properties, 9: 2650

Periscopes

stereoscopic, design of, for remote viewing, 9: 566(J)

Perovskites

crystal structure of $KNbO_3$ and nuclear resonance of Nb^{93}, 9: 1351(J)

neutron diffraction and magnetic properties, 9: 1067(R)

Peroxides

inorganic, preparation and properties, 9: 521

Pertechnetates

inhibition of corrosion by, 9: 1825

Pervanadyl ions

absorption spectra and chemical and thermodynamic properties, 9: 60

PETN

(See Pentaerythritol tetranitrate.)

Petroleum Refining Lab., Penna. State Univ. Coll. of Chemistry and Physics

progress reports on fluids, lubricants, fuels, and related materials, 9: 136(R), 2795(R), 3123(R)

Phantoms

mouse, rat, and rabbit, radiation depth-dosage determinations, 9: 2547(R)

preparation of, for radiation treatment planning, 9: 1727(J)

Pharmaceuticals

(See also Drugs.)

sterilization by high-energy electrons, 9: 2053(J)

Phase studies

(See also appropriate subheadings under specific alloys systems; see also Diffusion; Grain Growth; Solutions.)

analysis of continuity of one phase in a powder mixture of two phases, 9: 2243(J)

application of scintillation counter to vapor phase analysis, 9: 2873(J)

cubic to orthorhombic diffusion less phase changes, experimental and theoretical studies, 9: 3885(J)

design and performance of a tungsten-coil furnace for high-temperature x-ray diffraction investigations of phase changes and equilibria, 9: 2319(J)

effect of degree of dispersion and density of phases on equilibrium, 9: 63

theory of diffusionless phase transformations, 9: 1861(R)

Phenanthrene

solubility of, in a perfluoroamine and perfluoroether, 9: 95(J)

1,10-Phenanthroline

analytical uses for determination of Fe in presence of U, 9: 4074

1,10-Phenanthroline, iron(II) salts

(See Ferroin)

Phenanthroline complexes

effects of γ radiation, 9: 3267(J)

Phenols

adsorption of, by polyvalent forms of anion-exchange resins, 9: 2212(J)

metabolism of, effects of irradiation on, in rats, 9: 2548(R)

Phenothiazine

effects of, on uptake of I^{131} by thyroid gland in rats, 9: 508(J)

labeled with sulfur^{35}, preparation, 9: 4115(R)

toxicity of, for horses, 9: 1156(R)

Phenothiazine, 3-chloro-10-(3'-dimethylaminopropyl)-

x-ray protection of guinea pigs injected with, 9: 43(J)

Phosgene

fundamental vibrations of, 9: 917(J)

Phosphate glass

containing Co, as a high-level γ radiation dosimeter, 9: 1040

silver-activated, in measurement of high doses of γ radiation, 9: 3932

silver-activated, mapping gamma ray fields with, 9: 3261(J)

Phosphate ions

electrical mobility of, in paper electrochromatography, 9: 1222(J)

Phosphates

(See also specific phosphates.)

effects of dietary, on bone deposition of Sr^{90}, 9: 846

Phosphates (cont'd)

effects on metabolism, 9: 3(R)

hydrolysis velocity of pyrophosphate, tripolyphosphate, and hexametaphosphate, 9: 2618

isotopic exchange between tricalcium phosphates and solutions of, tracer study, 9: 90(J)

metabolism by algae, tracer study, 9: 3(R)

metabolism of, in erythrocytes in dogs, tracer study, 9: 2547(R)

ortho, coulometric determination, 9: 2177(J)

synthesis of P^{32} and S^{35} labeled diethyl-4-nitrophenylthiophosphate and ethyl-4,4'-dinitrophenylthiophosphates, 9: 2681(J)

Phosphatides

synthesis, effects of whole-body x irradiation on, in rats, 9: 1161(J)

Phosphine oxide, tris(trifluoromethyl)-

preparation, 9: 3418(J)

Phosphinic acid, bis(trifluoromethyl)-

preparation of, by hydrolysis of $(CF_3)_2PCl_3$ or $(CF_3)PCl_4$, 9: 3417(J)

Phosphites

oxidation of, by α rays, 9: 582(J)

Phosphorescence

(See also Fluorescence; Luminescence; Phosphors.)

design and performance of apparatus for detection and measurement of, in inorganic and organic compounds, 9: 3759(R)

Phosphoric acid

solubility of U(IV) orthophosphate in, at 25°C, 9: 129

Phosphoric acid, esters

synthesis, thermal decomposition, and properties of, used as high-temperature lubricants, 9: 517(R)

Phosphoric acid–uranium(IV) oxide systems

phase studies, 9: 129

Phosphors

(See also specific phosphorescent materials; see also Luminescence; Phosphorescence; Scintillation detectors.)

alkali halide, photostimulated emission of activated, 9: 2424(J)

argon treatment of liquid scintillators to remove dissolved O_2 and increase performance, 9: 1600

decay times of organic, 9: 2426(J)

effects of infrared radiation on doubly activated ZnS, 9: 431(J)

electroluminescence of organic, by alternating electric fields, 9: 1974(J)

electron trap distributions in, 9: 252(J)

energy transfer in irradiated solutions of mixed, 9: 3759(R)

enhancement of fluorescnece in, under high-energy irradiation 9: 2876(J)

fluorescent respone of NaI(Tl) to nuclear radiations, 9: 1043(J)

liquid, effects of solvents on pulse heights of, 9: 1978(J)

liquid, increasing fluorescence efficiency of, 9: 3952(J)

luminescence of alkali halides, activated by heavy metals, 9: 1784

luminescence of KBr–Ni and KBr–Cu excited by x-rays, 9: 3230(J)

luminescent efficiencies, 9: 232(R)

microheterogeneous structure of Ag-activated KCl and NaCl, 9: 2368(J)

neutron detection by standard and activated LiI crystals, 9: 3947(J)

organic, recombination luminescence in, 9: 864(J)

orientation of Eu ions in CaF_2, 9: 1934(J)

particle size distribution, measurement of, 9: 2344(J)

performance of, as neutron detectors, 9: 1601

performance of boric oxide glass, for slow neutron detection, 9: 1036

phosphorescence of inorganic, organic, and mixed, 9: 3759(R)

photoluminescence yield in KI(Tl), dependence on Tl concentration, 9: 1758(J)

Phosphors (cont'd)
plastic, polymerization of, 9: 1320(J)
potting of NaI and LiI, 9: 3936
preparation and properties of, for use with γ spectrometers, 9: 1597
preparation of certain organic compounds for use as solvents for, 9: 3773(J)
response of NaI(Tl), KI(Tl), and stilbene to fission fragments, 9: 1606(J)
scintillation, properties and performance of, in neutron detection, 9: 3931(R)
scintillation response of, at low energies, 9: 707(J)
symposium on solid inorganic, 9: 1614(J)
use in luminescence chambers, 9: 2860(J), 4248(J)
well-type scintillation crystals, effectiveness in bremsstrahlung counting P^{32}, 9: 1981(J)
x-ray-diffraction studies of Ag-activated halide, 9: 1933(J)
Phosphorus
determination of μg quantities of, in waters containing As, Si, and Ge by Mo blue reactions, 9: 2638(J)
effects of dietary, on metabolism of Ca and P in rats, tracer study, 9: 1156(R)
electroluminescence, 9: 2343(J)
foliar absorption and metabolism of, in strawberries, tracer study, 9: 3751
incorporation into nucleic acid, effects of whole-body x irradiation on, tracer study, 9: 3730(R)
mass spectrographic analysis, 9: 1032(J)
metabolism of, in rats, tracer study, 9: 1156(R)
photonuclear reactions, 9: 2449(J)
radiochemical determination, 9: 876
role of, in plant photosynthesis and respiration, 9: 3048
spectrophotometric determination of, as molybdovanadophosphoric acid, 9: 2635
tissue distribution of, in embryos and pregnant females, tracer study, in rats, 9: 19
tissue distribution of, in lymph nodes and tumors, tracer study, 9: 18
uptake in bean plants, effects of environmental factors on tracer study, 9: 3753
vaporization, 9: 2823(J)
Phosphorus(V) chlorides
complexes with zirconium tetrachloride, $ZrCl_4$ recovery from, 9: 1425(P)
Phosphorus compounds
organic, preparation and properties of, 9: 1792
Phosphorus fluorides
electrical conductivity, 9: 3415(J)
Phosphorus ions
transfer through mucosa of normal and artificially constructed bladders, tracer study, 9: 1732(J)
Phosphorus isotopes P^{28}
decay scheme, 9: 2997(J)
Phosphorus isotopes P^{29}
decay schemes, 9: 2057(J)
Phosphorus isotopes P^{30}
beta emission, 9: 1121
Phosphorus isotopes P^{31}
nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)
Phosphorus isotopes P^{32}
assay of liquid samples containing, by bremsstrahlung counting with a well-type scintillation crystal, 9: 1981(J)
beta emission, internal and external bremsstrahlung accompanying, 9: 2505(J)
Phosphorus isotopes P^{32} (cont'd)
beta spectrum, 9: 1994(R)
colloids of, preparation and tissue distribution in animals, 9: 1459(J)
differential uptake of, in diagnosis of intraocular neoplasms, 9: 49(J)
entrainment of, on Cu sulfide, 9: 862(J)
gamma emission of, 9: 807(J)
inactivation of bacteriophage by ingested, 9: 3367(J)
separation of, by diffusion, 9: 4235
tissue distribution in anesthetized and stimulated rabbit, 9: 2544(J)
Phosphorus oxides
heat and free energy of formation, 9: 529(J)
Phosphorus–oxygen–titanium systems
metallic phases in, 9: 858(J)
Phosphorus–oxygen–zirconium systems
metallic phases in, 9: 858(J)
Photochemistry
(See also appropriate subheadings under specific materials and radiations; see also Photosynthesis.)
identification of solvated electrons and radicals in rigid solutions of photooxidized organic molecules, 9: 864(J)
symmetrical semiquinone formation by reversible photooxidation and photoreduction, 9: 865(J)
theory of photo-electromotive forces developed at metal-semiconductor junctions, 9: 3761
Photoelectric cells
(See also Crystal detectors; Photomultiplier tubes.)
performance, 9: 3208(R)
properties and applications to electron multipliers, 9: 1617(J)
Photoelectric effect
theory of, 9: 655
Photographic emulsions
(See also Nuclear emulsions.)
resolving power and true exposure distribution, 9: 308(J)
scattering of 6.6-, 11.5-, and 18.0-Mev electrons by, 9: 2942(J)
Photographic film
measuring apparatus for, using a reference line of variable brightness, 9: 2396(J)
Photographic film detectors
commercial services, survey, 9: 2875(J)
effect of body backscatter on, 9: 3953(J)
performance of, in detecting x and γ radiation over a wide band of energies, 9: 1318
from photographic roll film from local drugstores for dosimetry following atomic disaster, 9: 698
radioactive measurements with, 9: 2432(J)
self-processing and self-reading, for rapid determination of γ dose, 9: 1965
storage, use, calibration, processing, and interpretation of results of, for dosimetry of x and γ radiation, 9: 2428(J)
Photography
(See also Cameras.)
bibliography of techniques and equipment, 9: 233
Photometers
for counting aerosol particles, design, 9: 4215
performance of, for aerosol detection, 9: 3775(R)
Photomultiplier tubes
analysis of dynode operation, 9: 2866(J)
application of photoelectric cells to, 9: 1617(J)
breakdown at high voltages, prevention of, 9: 1026(J)

Photomultiplier tubes (cont'd)
cosmic ray background effects, 9: 305
design and performance of a high-current, for use as radiation detector 9: 1039
design and testing, 9: 1893(R)
development of high-current and high-speed, 9: 3251(R)
effects of gamma radiation on gain of, 9: 1322(J)
efficiency for α particle detection, 9: 3600(J)
performance of, 9: 301
performance of, in neutron detectors, 9: 3931(R)
performance of, in scintillation counters for fast neutrons, 9: 1036
for scintillation counting, design and performance, 9: 1580(R)

Photoneutrons
measurement of yields with NaI crystal, 9: 3944(J)

Photons
(See also Cosmic photons; Gamma radiation; X radiation.)
absorption, nucleon displacement determined from harmonic mean energy for, 9: 1079(J)
Compton scattering of circularly polarized, by an electron with given spin directions, 9: 2035(J)
pairs, emission of, in magnetic fields, 9: 414(J)
production of multiple, by electron positron annihilation, 9: 1343(J)
scatter of unpolarized, by Na, atomic alignment from, 9: 245(J)
scattering by nucleons, calculation of cross section from experimental photomeson production cross section, 9: 405(J)
scattering of, theory, 9: 2031
scintillation counting of low-energy, for use in x-ray diffraction, 9: 313(J)
self mass, theory, 9: 1143(J)

Photoperiodism
effects on floral stimulus, 9: 3(R)

Photosynthesis
(See also Photochemistry.)
intermediate products of, isolation and degradation, tracer study, 9: 48
mechanisms of energy transfer during, 9: 3048
quantum energy requirements, 9: 3357
rate and carboxylation reaction, 9: 2136(R)

Photosynthetic products
distribution of, in phloem of grape, tracer study, 9: 3(R)
isolation and degradation of, tracer study, 9: 48

Phthalic acid, diethyl ester
addition compounds with $ZrCl_4$ and $HfCl_4$, preparation and properties, 9: 72(J)

Phthalocyanines
metal complexes, Szilard-Chalmers reactions in, 9: 1959(J)

Physics
(See also Astrophysics; Geophysics; Health Physics; Mathematics; Nuclear Physics.)
modern physics for the engineer, book, 9: 3902(J)
progress in metal, 9: 2305(J)
symposium on present state of, 9: 2337(J)

Picric acid
detonation velocities of, 9: 3214

Pipe joints
(See also Gaskets.)
high-pressure low-resistance, design and efficiency, 9: 4212

Piperidine
neutralization titrations of, in anhydrous pyridine, 9: 882(J)

Pipes
(See also Tubes.)
bends, effects of internal pressure on flexibility of large-radius, 9: 4124
effects of blast from atomic explosions on standpipes, 9: 650
laminar-turbulent transition phenomena in, 9: 3131(J)
radiography of welds in, 9: 4136(J)
welding of stainless steel, 9: 1279(J)

Pipettes
micro, remotely controlled, design, 9: 559(J)

Pitchblendes
(See also Uraninites.)
occurrence of, near Champagny, France, 9: 3160(J)
uranium recovery from nitric acid digestion residues of, 9: 601(J)

Pituitary gland
direct and explant-transplants of, effects on uptake of I^{131} by the thyroid gland of hypophysectomized rats, 9: 1733(J)
effects of irradiation of brain stem and hypothalamus on function of, in primates, 9: 832(J)
effects of irradiation of hypothalamus on function of, in primates, 9: 833(J)
influence of, on mast cell number in skin of rats, 9: 3(R)
radiosensitivity of, in toads, 9: 2550
tumors of, in irradiated and non-irradiated mice, 9: 2550(J)
tumors of, mechanism of induction and characteristics, 9: 1450(J)

Pituitary hormones
effects of hypophysectomy on radioinduced histologic changes in thyroid gland of rats, 9: 2113(J)
effects of injected, on radiation injuries in mice, 9: 1721(J)
effects of, on thyroid gland in toads, 9: 2550

Placerville District (Colo.)
mineralogy, 9: 1829

Plant cells
quantitative β-track radioautography, 9: 1734(J)

Plant metabolism
of calcium and Sr, effects of environmental factors, 9: 4056
effects of environmental factors on, tracer study, 9: 3753
effects of radiation on salt uptake in, 9: 26(J)
foliar absorption and metabolism of Ca and P by strawberries, tracer study, 9: 3751
of 3-hydroxypyruvic acid, 9: 2136(R)

Plant physiology
effects of photoperiodism on floral stimulus, 9: 3(R)
microsporogenesis in excised anthers of Trillium grown on sterile media, 9: 3718(J)

Plant respiration
quantum energy requirements, 9: 3357
relationship to photosynthesis, 9: 3048

Plants
(Limited to papers dealing with vegetation.)
alpha radioactivity in, 9: 445(J)
effects of periodic x radiation on, 9: 27(J)
effects of radiation on, 9: 1550(R)
somatic mutations produced by chronic exposure to γ radiation in carnations, 9: 4044

Plasma
(Limited to information on electric plasma; see also Electric discharge.)
electroacoustical waves in, 9: 1572(J)
line broadening in ionic, quantum theory, 9: 3224(J)

Plasma (cont'd)

longitudinal oscillations, 9: 3909(J), 3910(J)

mean temperature and velocity distributions and effects of magnetic field, 9: 4224(J)

nonmaxwellian theory of homogeneous and anisotropic, 9: 1016(J)

properties of slightly nonideal, 9: 1574(J)

resonance, effect on microwave transmission, 9: 4210(R)

theory of electrical probes for investigating, 9: 4225(J)

Plasters

(See also Gypsum products.)

mechanical properties of, 9: 1820(R)

Plastic deformation

growth of, in bar submitted to longitudinal impact, 9: 177

Plastic films

preparation and properties of thin polyvinylchloride-acetate copolymer for β spectrometry and 4π counting, 9: 1613(J)

as thin windows in cloud chambers, design of holder for, 9: 1055(J)

Plastic flow

(See also appropriate subheadings under specific materials; see also Fluid flow.)

mechanism of, 9: 1237

Plasticity

of metals, new criterion for, 9: 1867(J)

Plastics

bonding to plastics and to clad Al and Al alloys, effects of temperature on, 9: 651

corrosion resistance and applications of construction, survey and directory of, 9: 137(J)

effects of γ radiation on materials used in conjunction with 10-kc source, 9: 432(J)

effects of high-energy electron irradiation, 9: 2053(J)

effects of radiation on polymerization, 9: 1785(J)

effects of radiation on vinyl chloride–vinylidene chloride co-polymer methyl methacrylate, containing pH indicators, 9: 2847(R)

effects of radiation on vinylite, 9: 1554(R)

fatigue and stress, 9: 4159

hot pressure and cold-pressureless mounting, 9: 149(J)

inorganic, preparation and properties, 9: 4107

low-cost sealer utilizing, 9: 565(J)

mechanical properties of rigid, at low temperatures, 9: 3216

use in preparation of radiation detectors, absorbers, and standards, 9: 2387(J)

Plates

plastic buckling of simply supported, subjected to nonhomogeneous stress distribution, 9: 4121

Platinum

adsorption of O_2 and CO on evaporated films of, 9: 2159(J)

determination of, as sulfide, 9: 82(J)

extension of Matthiessen's Rule to cold-worked, 9: 1536(J)

intermetallic compound with Nb, preparation and structure, 9: 3878(J)

range-velocity relation for fission fragments, 9: 1365(J)

spectrographic determination of, in ores and rocks, 9: 162

thermal conductivity in region 1300 to 1800°K, 9: 1564(J)

Platinum–cobalt alloys

thermodynamic properties, 9: 2294(R)

Platinum–copper alloys

thermodynamic properties, 9: 2294(R)

Platinum–iridium alloys

number of vacancies and energy of vacancy formation in, 9: 3525(J)

Platinum isotopes

Szilard-Chalmers concentration, 9: 1959(J)

Platinum isotopes Pt^{192}

energy levels and γ spectra, 9: 4333

Platinum isotopes Pt^{194}

energy levels from Ir^{194} decay and spins of first two excited states, 9: 4329(J)

Platinum isotopes Pt^{195}

excited levels from Au^{195} decay, transition, 9: 387

Platinum isotopes Pt^{199}

decay schemes, 9: 988(R)

Platinum metal oxides

heat and free energy of formation, 9: 529(J)

Platinum–nickel alloys

relaxation effects in solid solutions of, arising from changes in local order, 9: 204(J)

Platinum–platinum–rhodium alloys couples

calibration of, against standard Pt resistance thermocouples, 9: 185

Platinum–ruthenium alloys

electric conductivity, 9: 976

Plutonium

absorption and x-ray spectrum, 9: 2081(J)

absorption of, from gastrointestional tract, comparison between rats and pigs, 9: 1703

electrodeposition, 9: 3803(J)

excretion of, effects of Ca EDTA on treatment of, 9: 1739

films, preparation of thin, 9: 3945(J)

fission cross section for thermal neutrons, 9: 1094(J)

gastrointestinal absorption and bone deposition of, effect of concentration of Pu in diet on, 9: 501

magnetic susceptibility of, effects of temperature, 9: 599(J)

neutron irradiation of, Bk and Cf isotopes produced by, 9: 1489(J)

physical properties, 9: 2682(J)

production of, in heavy water reactors, 9: 1081(J)

radiometric determination of, in presence of U, 9: 1598

separation of transplutonic elements from, design of equipment for, 9: 571(J)

separation plants and procedures, 9: 590(J)

separation process and facilities at Harwell, 9: 591(J)

spectra, Zeeman effects in, 9: 4111(J)

tissue distribution of, effects of Zr on, in rats, 9: 3(R)

titrimetric and radiometric determinations, ANL procedures for, 9: 4074

Plutonium compounds

determination of free acid in solutions of, 9: 4110

Plutonium(III) fluorides

heats and free energies of sublimation and vapor pressure of, at elevated temperatures, 9: 3800(J)

Plutonium(IV) fluorides

hydrated, preparation and properties, 9: 1210(J)

preparation, hydration, thermogravimetric analysis, x-ray diffraction analysis, precipitation from aqueous solution, and reactions with aqueous hydrofluoric acid, 9: 1210(J)

Plutonium(VI) ions

determination of, in solutions, 9: 4110

Plutonium isotopes

chemical separation after proton irradiation of natural U, 9: 2673(J)

Plutonium isotopes Pu^{239}

fission cross section at 0.01 to 0.95 ev, 9: 1093(J)

Plutonium isotopes Pu^{239} (cont'd)
fission products, study after long intense neutron irradiation, 9: 2136(R)
velocity fine structure of fission fragments, 9: 1365(J)
Plutonium(IV) oxides
fluorination with hydrogen fluoride and aqueous hydrofluoric acid, 9: 1210(J)
Pocket chambers
with built-in charger, for personnel protection from x and γ radiation, 9: 1328(J)
design of integrating ionization, of nearly uniform polar response, 9: 4249(J)
effect of body backscatter on, 9: 3953(J)
Pocono Formation (Penna.)
exploration and geology of, 9: 164(J)
Poison Spring Canyon Area (Utah)
mineralogy, 9: 1829
Polar Mesa (Utah)
geophysical exploration, stratigraphy and U distribution, 9: 160
Polarographs
square-wave, design and performance, 9: 3402(J)
Polarography
electrolytes for determination of U by, 9: 1149(J)
electrolytes for determination of U by, in presence of other ions, 9: 1150(J)
theory of slow electrode reaction in, 9: 4064(J)
Poliomyelitis
effects of radiation on virus of, 9: 491(J)
virus, radioinduced inactivation, 9: 3737(J)
Polishing
(See also Cleaning; Electrolytic polishing.)
methods for, of W and Mo metallographic specimens, 9: 1865(J)
universal method for, for metallography, 9: 3879(J)
Polonium
alpha activity from, measured by kinetic nucleography, 9: 713(J)
distribution, excretion, and retention of, in rats, 9: 1705
distribution of, in blood fractions, following injection in rats, tracer study, 9: 509(J)
distribution of, in blood of rats and dogs, 9: 1708(J)
electrodeposition of, apparatus for measuring, 9: 3757
extraction by mesityl oxide, 9: 2674(J)
ion exchange of, from Bi at room temperature, 9: 593(J)
neutron spectrum from, 9: 1346(J)
radiometric determination, 9: 2634
segregation to grain boundaries in Bi–Pb alloys, 9: 3186(J)
solubility, in HNO_3, 9: 4060
tissue distribution of, in rats, 9: 4055
Polonium compounds
composition of polonium dithizonate, 9: 4069(J)
Polonium isotopes
alpha decay in, relation to shell model, 9: 1999(J)
alpha spectra of light, 9: 1410(J)
spectrographic analysis of, for Po^{208} and Po^{209}, 9: 76
Polonium isotopes Po^{208}
spectrographic determination of, in Po^{208}–Po^{209} mixtures, 9: 76
Polonium isotopes Po^{209}
spectrographic determination of, in Po^{208}–Po^{209} mixtures, 9: 76
Polonium isotopes Po^{210}
decay, branching ratio in, 9: 2512(J)
Polonium isotopes Po^{210} (cont'd)
preparation of, by vacuum-sublimation of Po deposited on Ag, Ni, and Pt, 9: 2219(J)
radiocolloidal properties of, 9: 62
toxicity of, in rats, 9: 4055
Polonium isotopes Po^{211}
radiation of great track length from, 9: 808(J)
Polonium isotopes Po^{212}
angular correlations (α–γ), 9: 2974(J)
Polonium isotopes Po^{216}
radiation of great track length from, 9: 808(J)
Polonium nitrates
solubility in HNO_3, 9: 4060
Polonium oxides
heat and free energy of formation, 9: 529(J)
Polonium(IV) oxides
preparation and crystal structure, 9: 2219(J)
Polonium sources
(See Alpha sources.)
Polymerization
(See also appropriate subheadings under specific materials.)
of ethylene produced by γ radiation, 9: 1550(R)
of N-vinylpyrrolidone induced by exposure to γ radiation, 9: 1781(R)
Polymers
(See also specific polymers, e.g., Styrene polymers.)
charged, distribution of, at equilibrium in a centrifugal field, 9: 525(J)
compression of, at high pressures, temperature dependence, 9: 863(J)
dynamic mechanical properties of, apparatus for measuring, 9: 2239(J)
effects of radiation on synthesis and properties of, 9: 1785(J)
high-temperature resistant, synthesis and properties, 9: 3799
infrared studies of, as a means for estimating deterioration, literature survey, 9: 3115
inorganic, preparation and properties, 9: 4107
mechanical properties of, literature survey, 9: 3452
molecular weights of, charged, in presence of supporting electrolyte, and errors due to neglect of this charge, 9: 525(J)
thermal conductivity of silicone and hydrocarbon, 9: 2336(J)
Polytechnic Inst. of Brooklyn
progress reports on high-value insulators, 9: 3388(R), 3888(R)
Populations
congenital malformations in, from exposure to x radiation, 9: 3025(J)
of finite variance, efficiency of the sample median in statistical analysis, 9: 3586
multiple sampling applied to statistical analysis of, 9: 2103
natural, of Drosophila, genetic factors, 9: 5(R)
statistical analysis of, moments of the sample median, 9: 3585
of yeasts, effects of physical and chemical environment and exposure to x radiation, 9: 1712
Porcelain
mechanical properties of, 9: 1820(R)
Porcelain enamels
decontamination characteristics of, 9: 617(J)
Porosity
determination of pore size distribution from adsorption isotherms, 9: 2216(J)
effects on thermal stress fracture, 9: 1507(J)
Porphyrins
structure, by LCAO MO method, 9: 4099(J)

Porphyrins (cont'd)

tissue distribution of, in normal and tumor-bearing mice, tracer study, 9: 4039(R)

Positronium

annihilation radiation, 9: 3965(R)

review on, in Annual Review of Nuclear Science, 9: 4007(J)

Positrons

absorption of, in Cu and Cd, 9: 415(J)

annihilation of, in liquids and solids, 9: 2936(J)

annihilation of, in various materials, angular correlation of radiation from, 9: 4312(J)

Coulomb scattering of high-energy, by nuclei, 9: 3671(J)

formation of monochromatic, analysis, 9: 1910(J)

thermalization in metals, 9: 4001(J)

three-photon annihilation of electron-positron pairs, 9: 669(J)

three-quantum annihilation of, in various materials, 9: 249(J)

Potassium

chromatographic determination of, in mixtures of Na, K, Mg, and Ca, 9: 3400(J)

cosmic abundance of, in chondritic meteorites, 9: 3065(J)

direct determination by precipitation as potassium fluoborate from ice-cold solution, 9: 2175(J)

distribution of, in brain tissue, tracer study, 9: 2099(R)

entropy at 25°K, 9: 2735(R)

exchange with Na across erythrocyte surface, tracer study, 9: 2099(R)

ion exchange separation from Ca and Mg and titrimetric determination of, 9: 1200(J)

quenching of resonance radiation by H_2 and D, 9: 248(J)

reaction with $BF_3 \cdot NH_3$, 9: 515

spectrophotometric determination of, in siliceous, argillaceous, and phosphate rocks, 9: 78

transport of, in human erythrocytes, tracer study, 9: 1735(J)

Potassium (liquid)

surface tension of, by drop-weight method, 9: 527(J)

viscosity, 9: 1277(J)

Potassium amide

reaction with $BF_3 \cdot NH_3$, 9: 515

Potassium antimonides

crystal structure, 9: 1893(R)

Potassium–bismuth alloys

microhardness and surface tension, 9: 3527(J)

Potassium borates

coloration, 9: 4314(J)

Potassium bromide crystals

fluorescence and thermoluminescence in x-irradiated, 9: 3682(J)

radiosensitivity, 9: 4243

Potassium bromides

emission, excitation, and absorption spectra of Ag-activated, 9: 3116(J)

luminescence of Ni and Cu activated, excited by x rays, 9: 3230(J)

Potassium chloride–aluminum chloride systems (liquid)

electric conductivity, 9: 2613

Potassium chloride–cadmium chloride systems (liquid)

electric conductivity, 9: 2139(J)

Potassium chloride–calcium chloride–lithium chloride systems

phase studies, 9: 4059

Potassium chloride–copper chloride systems (liquid)

electric conductivity, 9: 2139(J)

Potassium chloride crystals

additive coloring reaction in, reversibility, 9: 2330

effects of radiation on electric conductivity and mechanical properties, 9: 800(R)

fluorescence and thermoluminescence in x-irradiated, 9: 3682(J)

state of colloidal particles, 9: 2330

Potassium chloride–lead chloride systems (liquid)

electric conductivity, 9: 2139(J)

Potassium chloride–lithium chloride–potassium fluoborate systems (liquid)

electrolysis of, in temperature range 350 to 550°C, 9: 52

Potassium chloride–potassium systems

properties, heat of reaction, and reaction mechanisms, 9: 852

Potassium chloride–sodium chloride systems (liquid)

explosions with water, prevention of, 9: 1743

Potassium chlorides

adsorption of, on gold surfaces, 9: 3766

adsorption on powdered silver, 9: 3432(J)

coloration and luminescence of, radiation-induced, 9: 4314(J)

emission, excitation, and absorption spectra of Ag-activated, 9: 3116(J)

energy band structure, theory, 9: 231(R)

vapor pressure lowering of water by addition of, 9: 524(J)

Potassium chloromolybdates(III)

electrolysis of, dissolved in molten alkali halides for preparation of Mo, 9: 2221(J)

preparation of, 9: 2222(J)

Potassium chromates

effects of, on Al corrosion, 9: 4143(J)

Potassium cyanides

radiation protection, 9: 2599(J)

Potassium fluoborate–lithium chloride–potassium chloride systems (liquid)

electrolysis of, in temperature range 350 to 550°C, 9: 52

Potassium fluoborate–potassium metaborate–potassium tetraborate systems (liquid)

electrolysis of, in temperature range 350 to 550°C, 9: 52

Potassium fluoborates

direct determination of K by precipitation of, from ice-cold solutions, 9: 2175(J)

toxicity, 9: 4054

Potassium fluoride–lithium fluoride–sodium fluoride systems

thermal capacity and enthalpy, 9: 634(R)

Potassium fluoride–potassium systems

phase studies and vapor pressure, 9: 3771(J)

Potassium fluorides

fluorescence and thermoluminescence in x-irradiated crystals of, 9: 3682(J)

Potassium hydroxides

infrared spectra of natural and hydrated, at room and liquid-air temperatures, 9: 3434

Potassium iodates

fission recoil of I^{131} from U oxide particles into, chemical effects, 9: 3422(J)

Potassium iodide crystals

fluorescence and thermoluminescence in x-irradiated, 9: 3682(J)

response of thallium-activated, to fission fragments, 9: 1606(J)

Potassium ions

activity measurements with resin membrane electrodes, 9: 2149(J)

conductometric determination of, in paper chromatograms, design and performance of apparatus for, 9: 2215(J)

Potassium isotopes

mass ratios of, determined from microwave spectra of alkali halides, 9: 811(J)

Potassium isotopes K^{39}

decay and half lives, 9: 1680(J)

half life, 9: 2951

Potassium isotopes K^{39}

alpha reactions (α,p), ground state Q values from, 9: 2441(J)

gamma reactions (γ,nα), 9: 3674(J)

nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)

Potassium isotopes K^{40}

branching ratio, 9: 988(R)

contribution of, to natural radioactivity of man, 9: 444(J)

decay into A^{40} in dating of archeological specimens, 9: 3463(J)

electromagnetic separation, 9: 1956

in vivo determination of, in human skeleton, 9: 1980(J)

nuclear magnetic moment, 9: 988(R)

nuclear magnetic moment of, calculated by proton-neutron coupling, 9: 742(J)

ratio to A^{40} in meteorites, age determination by, 9: 1915(J)

Potassium isotopes K^{41}

alpha reactions (α,p), ground-state Q values from, 9: 2441(J)

nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)

Potassium isotopes K^{42}

beta spectra, 9: 1994(R), 3965(R)

determination of, in body fluids, simultaneously with determination of Na^{24}, 9: 1465(J)

gamma radiation from, counting in the presence of Na^{24}, 9: 2429(J)

Potassium metaborate–potassium fluoborate–potassium tetraborate systems (liquid)

electrolysis of, in temperature range 350 to 550°C, 9: 52

Potassium niobates

crystal structure, and nuclear resonance of Nb^{93} in, 9: 1351(J)

Potassium nitrates

effect on the vapor tension and calorimetry of 100% and aqueous solution of nitric acid, 9: 2140(J)

perpendicular bending frequency in, N^{15} isotope shift, 9: 919(J)

Potassium–potassium chloride systems

properties, heat of reaction, and reaction mechanisms, 9: 852

Potassium–potassium fluoride systems

phase studies and vapor pressure, 9: 3771(J)

Potassium–sodium alloys (liquid)

circulation systems, instrumentation, 9: 4179(R)

corrosion of Zr and stainless steel and analysis of, 9: 1254

corrosive effects on electrical insulating materials, 9: 4179(R)

equilibrium solubility of Fe in, equipment and procedures for studying, 9: 3501

friction factor, effects of Reynolds Number on, 9: 4179(R)

heat-transfer coefficients of Zr tubing in, 9: 1254

heat-transfer properties and electrical resistance, 9: 4179(R)

sampling, 9: 4179(R)

viscosity, 9: 1277(J)

wear of, stainless steel bearings in, 9: 2280

wetting of surfaces with, heat transfer in, 9: 4175(R)

Potassium–sodium compounds (intermetallic)

thermodynamic properties, 9: 2735(R)

Potassium tetraborate–potassium fluoborate–potassium metaborate systems (liquid)

electrolysis of, in temperature range 350 to 550°C. 9: 52

Potassium uranium fluorides

crystal structure, 9: 2227(J)

Potassium uranyl fluorides

crystal structure, 9: 2225(J), 2227(J)

Potassium zirconium fluorides

electrolysis of, to produce Zr metal, 9: 3201(J)

Potatoes

effects of γ radiation on taste and storage life, 9: 2552(J)

Potentiometers

design and construction, 9: 518

design, testing, and construction of recording precision microvolt, 9: 2792(R)

for measuring emf of thermocouples, design and performance, 9: 1581

Potentiometric analysis

of aqueous ferrous solutions by x-ray oxidation, 9: 2644(J)

Pottsville Formation (Penna.)

geology and U distribution, 9: 164(J)

Powder metallurgy

(See also appropriate subheadings under specific materials.)

applicability of, to problems of high-temperature materials, review, 9: 198(J)

development of, review, 9: 2302(J)

friability test as method of evaluating sinter cake, 9: 2244(J)

Powder Metallurgy Lab., Rensselaer Polytechnic Inst.

progress reports on powder metallurgy of Al, 9: 2716(R), 4163(R), 4165(R)

Powder River Basin (Wyo.)

exploration, 9: 1514(R)

uranium bearing sandstone and coal deposits in, 9: 2263

Powders

(See also specific powders; see also Metal Powders; Particles.)

analysis of continuity of one phase in a powder mixture of two phases, 9: 2243(J)

density of, measured by gas burette, 9: 1290(J)

determination of specific surface of sieve-size methods, 9: 2622(J)

fine, flow properties, 9: 4126(R)

preparation of, from ground sinter cake, 9: 2244(J)

size reduction, review, 9: 3232(J)

very fine, particle size measurement, 9: 1291(J)

Power reactors

(See also Aircraft reactors; Nuclear power.)

design, 9: 3293(J), 3294(J)

design and cost factors, 9: 756(J)

design of British Calder Hall power station, 9: 372(J)

heterogeneous, advantages of, 9: 1357(J)

nuclear fuel and inventory costs, 9: 370

proposed, for Italy, 9: 2908(J)

reducing costs of, 9: 1642(J)

Power supplies

constant-potential, for sigma welding, 9: 210(J)

design and performance of high-voltage, 9: 656

high-voltage, for neutron survey equipment, design, 9: 3250

for magnet coil of high-energy proton synchrotrons, 9: 1098

precision high-voltage, suitable for use with ionization chambers, 9: 3244(J)

Power supplies (cont'd)

radioactive and photoelectric p–n junction power sources, 9: 251(J)

transistor high-voltage, for portable Geiger counters, 9: 1944

Praseodymium

paramagnetic resonance absorption spectra, 9: 2075(J)

solvent extraction of, into TBP and into a TBP and TTA mixture in kerosene, 9: 906

Praseodymium chlorides

paramagnetic resonance absorption, 9: 2072(J)

Praseodymium(III) ions

thermodynamic formation constants in aqueous solution for reaction of, with acetylacetonate at 30°C, 9: 1191(J)

Praseodymium isotopes

neutron-deficient, half lives and decay, 9: 1131(J)

Praseodymium isotopes Pr^{142}

gamma emission, 9: 1407(J)

Praseodymium isotopes Pr^{143}

gamma emission, 9: 1407(J)

Praseodymium isotopes Pr^{144}

gamma spectra, 9: 1402(J), 1403(J)

Praseodymium nitrates

preparation of anhydrous, by reaction of oxides and NO_2, 9: 112(J)

Praseodymium oxides

phase studies of, between PrO_2 and Pr_2O_3, 9: 114(J)

preparation of, by high-pressure molecular O treatment, 9: 903(J)

x-ray and differential analysis of, in the composition range Pr_2O_3 to Pr_6O_{11}, 9: 110(J)

Pressure

automatic recorder for, for study of gas-phase kinetics, 9: 2834(J)

bibliography and index on measurement of dynamic, and related subjects, 9: 3223(J)

methods of measurement, 9: 3547(R)

Pressure drop

in starting area of air-passed slots, 9: 2230(J)

Pressure gages

design of, for measuring static gas pressure around body moving in air, 9: 1429(P)

design, for SIR cooling system, 9: 272

for liquid metals, design and testing, 9: 4179(R)

Pressure transmitters

design, for SIR cooling system, 9: 272

Pressure vessels

(See also Tanks.)

biaxial fatigue properties of high-strength steels for, 9: 4196(J)

charts and nomographs for design of, 9: 3441(J)

design, fatigue strengths of metals as consideration in, 9: 214(J)

plastic fatigue properties of high-strength steels for, 9: 4195(J)

welding procedure qualification tests on 3 pairs of high-strength steels for, 9: 4198(J)

Prisms

resolving power, 9: 2522(J)

Promethium

tissue distribution of, in rats, tracer study, 9: 3730(R)

Promethium isotopes Pm^{189}

disintegrations and decay scheme, 9: 1671(J)

Promethium isotopes Pm^{191}

disintegration of, coincidence studies, 9: 3686(J)

Propane, 2-chloro-2-methyl-

reactions of, chlorine isotope effect in, 9: 67(J)

Propanedioic acid

(See Malonic acid.)

1,2-Propanediol, hexafluoro-

reaction with butyl formal, 9: 1767(R)

Propionitrile

direct fluorination, 9: 890

Proportional detectors

absolute disintegration rates by, 9: 3603(J)

borazole filled, counting properties for detection of thermal neutrons, 9: 2417

dating of C^{14} with, filled with CO_2, 9: 3593(J)

design and operation of, of uniform sensitivity, 9: 716(J)

for detection of fast neutrons, design and performance, 9: 3252

external cathode, performance, 9: 1330(J)

high-pressure, for studying ionization energy loss of fast μ mesons, 9: 2489(J)

minimum particle trajectory necessary for detection, determination of, 9: 2099(R)

performance of, for detecting fast neutrons in the presence of γ radiation, 9: 3934

recoil, for detection of fast neutrons, performance, 9: 3951(J)

thin wide-aperture, design and performance of, 9: 1054(J)

using high-humidity gases, reduction of spurious pulses in, 9: 2871(J)

Prostate gland

blood-drop determination of Au^{198} in therapy of, 9: 3750(J)

Protactinium

decay schemes and conversion electrons, 9: 383(J)

preparation, 9: 904(J)

separation from Fe by ion exchange in HCl–HF solutions, 9: 3102(J)

Protactinium bromides

preparation, 9: 904(J)

Protactinium chlorides

preparation, 9: 904(J)

Protactinium fluorides

preparation, 9: 904(J)

Protactinium hydrides

preparation, 9: 904(J)

Protactinium iodides

preparation, 9: 904(J)

Protactinium isotopes Pa^{234}

gamma-beta branching ratio of UX_2 and half life of UZ, 9: 1126(J)

Protactinium oxides

preparation, 9: 904(J)

Protactinium oxysulfides

preparation, 9: 904(J)

Proteins

biosynthesis, tracer study, 9: 3(R)

from blood, protective effects against radiation injuries in mice, 9: 2598(J)

dietary, effects on excretion of nitrogen following total-body x irradiation, 9: 2568(J)

effects of radiation on, review of literature, 9: 2549

self-diffusion coefficients of water and ovalbumin in aqueous ovalbumin solutions, tracer study, 9: 1229(J)

serum, effects of radiation on, of rats having a benzopyrene-induced tumor, 9: 31(J)

Proteins (cont'd)

solutions of, self-diffusion of water in, theory, 9: 1187(J)

Proton beams

external, from cyclotrons, device for stabilizing, 9: 2924

measurement of gas density with, 9: 1940(J)

Proton scattering cross sections

elastic, for 460-Mev protons on protons, 9: 2934(J)

elastic for 460- to 660-Mev protons on protons, 9: 2491(J) 2493(J) 2935(J)

measuring equipment for scattering by deuterons, 9: 2470(J)

Proton sources

operating characteristics of high-yield r-f, 9: 280(J)

regulating supply of H_2 for, Ni diffusion leak for, 9: 3440(J)

Proton synchrotrons

(See Synchrotrons.)

Proton total cross sections

of ten light elements and the neutron at 208 and 315 Mev, 9: 358(J)

Protons

angular distribution and yield of, from B^{10} (d,p)B^{11} reaction, 9: 406(J)

Protons

angular distributions in (n,p) reactions, theory, 9: 2936(J)

annihilation of anti-, flight, 9: 261(J)

anomalous magnetic moment, 9: 3348(J)

attenuation of 340-Mev, by U, 9: 778

bombardment of C targets by high-energy, production of neutrons in, 9: 1993(J)

bremsstrahlung, differential cross-section calculations, 9: 4205(R)

charge exchange with negative ions of atomic H, 9: 3672(J)

charge transfer cross sections for, in rare gases and H_2, 9: 2806(J)

collision of high-energy, with nuclei, 9: 1667(J)

collision with neutrons, neutral meson-deuteron production from, 9: 784(J)

detection and measurement of, from photonuclear reactions, 9: 1037

distribution of, in nucleus, equations, 9: 456(J)

elastic scattering, angular distribution measurements, 9: 2099(R)

elastic scattering by deuterons, 9: 2470(J)

elastic scattering by He, 9: 410(J)

elastic scattering by He at 9.76 Mev, 9: 4301(J)

elastic scattering of, by fluorine, 9: 796(J)

elastic scattering of, by protons from 440 to 1000 Mev, angular distribution, 9: 3318(J)

elastic scattering of electrons from, angular distributions, 9: 4309(J)

electron capture from He atoms by, 9: 1287(J)

energy relations in nuclear emulsions, tables of, 9: 1557(J)

focusing system for 600-Mev, in linear accelerators, 9: 1097

formation of π^0 mesons by 670 Mev, relation to absorber atomic weight, 9: 3607(J)

gamma reactions (γ,π^-) from 170 to 340 Mev, 9: 1987(J)

inelastic collisions with He atoms, 9: 1380(J)

interactions of 1.37-Bev π mesons with, production of heavy unstable particles by, 9: 4257(J)

interactions with negative pions at 1.4 bev, 9: 2940(J)

interactions with protons, 9: 3652(J)

ionization yield in N, 9: 4266(R)

lifetimes of unbound and bound, lower limit for, 9: 994(J)

magnetic resonance measurement, 9: 366(J)

mass difference of neutrons and, 9: 732(J)

Protons (cont'd)

mass difference of neutrons and, by difference of electromagnetic self-energies, 9: 352(J)

mass difference theory, 9: 1078(J)

meson production by nucleon collisions, 9: 1069(J)

π-meson scattering by, tables, 9: 2930

monoenergetic, α disintegration of nuclei excited by, 9: 2917(J)

multiple Coulomb scattering and residual range in nuclear emulsions, relation between, 9: 4306(J)

multiple scattering in nuclear emulsions, 9: 2483(J)

nuclear reactions in Mg^{25}, compared to N^{14} reactions in C^{13}, 9: 1649(J)

nuclear reactions (p,2p), (p,2p) and (p,pn) with He^4, 9: 377

nuclear resonance in liquid molecules, 9: 1639(J)

photoproduction in coincidence with neutrons, 9: 2331(R)

polarization direction measurement of proton spin, 9: 2036(J)

polarization in p-p scattering at 170 Mev, 9: 3966(R)

polarization, review, 9: 1400(J)

polarization in p-p scattering at reduced energy, 9: 2890(R)

polarization in p-p scattering for P and F waves, formula, 9: 787(J)

polarization of, by proton scattering, 9: 416(J)

polarization of, by scattering from Be, 9: 1110(J)

polarization of, in (d,p) reactions, 9: 1647(J)

polarization of high-energy, in elastic scattering on He and C, 9: 789(J)

polarized, slowing down in various attenuators, 9: 2039(J)

positive, negative, and neutral components from solids bombarded with, 9: 2486(J)

production cross sections and angular distribution for, from $\pi^+ + d \rightarrow p + p$ reaction, 9: 424(J)

proton reactions (p,dπ^+) at 460 Mev, 9: 3605(J)

proton reactions (p,dπ^+) at 510 to 660 Mev, 9: 3606(J)

proton scattering, angular distributions at 18.3 and 32.0 Mev, 9: 409(J)

range-energy and energy-momentum relations, tables, 9: 402

range-energy relations of, in nuclear emulsion at energies up to 2 Bev, 9: 3939(J)

range of 208-Mev, in nuclear emulsions, 9: 3669(J)

reaction $p + p \rightarrow \pi^+ + d$ with polarized protons, 9: 790(J)

reactions with H^3, energy levels of α particles from, 9: 741(J)

recoil tracks from stars produced by 50- to 450-Mev, 9: 1589(J)

scattering and Coulomb interference of 113-Mev π^+ mesons by, 9: 1337(J)

scattering by deuterons, 9: 2037(J)

scattering by Mg and Be at 3 to 6 Mev, differential cross sections for, 9: 2944(J)

scattering by neutrons, radiation from, 9: 1376(J)

scattering by protons, Coulomb interference effects in, 9: 1663(J)

scattering by protons, determination of transition matrix in, 9: 4308(J)

scattering by protons, possible triple-scattering experiments for studying, 9: 1660(J)

scattering cross sections for 5.77-Mev protons, 9: 1394(J)

scattering of π^- mesons with heavy-particle production, 9: 1666(J)

scattering of 437-Mev, by protons, 9: 776

scattering of 14.1-Mev neutrons by, 9: 2939(J)

scattering of 91-Mev neutrons by, 9: 1392(J)

scattering of 160-Mev mesons by, 9: 1108

spallation-fission of U by 340- to 350-Mev, 9: 4343(J)

stopping cross sections, 9: 2026

Protons (negative)

production and annihilation, 9: 1345(J)

Protozoa

(See also Amoeba; Paramecium; etc.)

effects of x radiation on division rate and survival of Tillina and Colpoda, 9: 2584

radioinduced mutations in, 9: 1716(J)

Psychology

discrimination learning in monkeys with implications for investigation of psychobiological effects of ionizing radiation, 9: 4

memory, effects of radiation on, in monkeys, 9: 478, 479

Pulse analyzers

(See also Oscillographs.)

circuit design, 9: 3941(J)

circuits for electronic pulse divider, 9: 2418(J)

design, 9: 1434(P)

design, for closely-spaced distributions, 9: 3965(R)

design and performance, 9: 3585

design for γ scintillation spectrometers, 9: 696

design of 50-channel, 9: 1585(J)

ionization, for resolution of α spectra, 9: 3595(J)

Pulse columns

design and capacity factors in performance of perforated-plate, 9: 1480

design and flooding characteristics, 9: 1481

design and performance, 9: 589(J)

design and performance of a louvre-plate redistributor for large-diameter, 9: 588(J)

packed, calculation of pulse amplitude, 9: 3790

Pulse counters

(See Scalers.)

Pulse generators (electronics)

design, 9: 1020

design, using Hg relays, 9: 1946

Pulse integrators

design of portable, low-counting speed, 9: 710(J)

Pulse modifiers

circuits for electronic pulse divider, 9: 2418(J)

Pulses

millimicrosecond techniques, 9: 2349(J)

synthesis of, by networks, 9: 1020

Pumpkin Buttes Area (Wyo.)

uranium bearing sandstone and coal deposits in, 9: 2263

uranium distribution, geology, mineralogy, and exploration, 9: 627(J)

Pumps

testing, 9: 136(R)

testing of high-temperature hydraulic, 9: 2795(R) 3123(R)

Pumps (liquid metal)

design and performance of electromagnetic, 9: 3443

design of centrifugal 50 hp, for sodium, 9: 943(J)

GE induction type for Na, testing, 9: 4175(R)

Pupae

effects of high-tension oxygen on, of Habrobracon, 9: 1729(J)

Purines

biosynthesis of, by E. coli, tracer study, 9: 2547(R)

Pyridine

neutralization titrations in anhydrous, 9: 882(J)

reaction with methyl iodide, 9: 2646(J)

Pyridine (cont'd)

reactions with BF_3, 9: 2624(J)

Pyridine complexes

with selenium tetrafluoride, preparation, 9: 2220(J)

Pyrites

occurrence in black shales, 9: 1826(R)

Pyrohydrolytic analysis

of fluorides and other halides, design of apparatus for, 9: 3411(J)

Pyrometers

design of, using G-M counters, 9: 1430(P)

dichromatic radiation, design, 9: 3806

2,3-Pyrrolidinedione, 1-(4-nitrophenyl)-5-phenyl-

decarboxylation, 9: 2136(R)

Pyrrolidone, vinyl-

polymerization by γ radiation, 9: 1781(R) 4100

Pyrrolidone, vinyl- polymers

effects of radiation on molecular weight, 9: 4100

Q

Quantum electrodynamics

(See also Field theory.)

proper-time electron formalism, 9: 3350(J)

Quantum mechanics

(See also Mathematics; Physics.)

angular momentum in, 9: 2526

applied to studies of the adsorption of gases on the surface of a solid, 9: 3433(J)

coherent scattering of γ rays by K electrons in heavy atoms, 9: 2479(J)

generalized spin representation, 9: 1417

influence of relativistic terms in meson theory of nuclear forces, 9: 2085(J)

isotopic spin quantum number for light nuclei, validity of, 9: 1689

nonlinear quantum theory of the electron, 9: 1936(J)

relativistic quantum theories of interacting particles, 9: 2532

symmetry operations in, 9: 2528

Tamm-Dancoff method in configuration space, 9: 2531

Tamm-Dancoff methods and nuclear forces, 9: 1696(J)

Quantum physics

(See Nuclear physics.)

Quartz

adsorption of dodecylamine acetate and wettability, 9: 1486

adsorption of Na and Cl on, 9: 3111(R)

adsorptive properties of, for Na^+, effect of pH, 9: 623(R)

coloration of, induced by γ and reactor irradiation, 9: 4102(J)

effects of pile irradiation on, 9: 4011(J)

flotation with anionic collectors, application of Gouy and Stern concepts of electrical double layer by streaming potential studies to, 9: 3107(J)

fused, radiation-induced color centers in, 9: 4315(J)

grinding of, in vibratory ball mill, 9: 623(R)

isotopic equilibration determination of O in, 9: 3394

three-quantum annihilation of positrons in, 9: 249(J)

Quartz Creek Pegmatite District (Colo.)

geology, 9: 4156(J)

Quartz fibers

drawing, methods and equipment, 9: 1479

Quinones

formation of, by reversible photooxidation and photoreduction, 9: 865(J)

8-Quinolinol chelates

with thorium, Ce, or La, precipitation, 9: 83(J)

with uranium(VI), absorption spectra, 9: 131(J)

8-Quinolinol, 5,7-dihalo- chelates

with uranium(VI), absorption spectra, 9: 131(J)

R

Rabbits

effects of periodic x radiation on, 9: 27(J)

lethal effects of radiation, 9: 2567(J)

metabolism of Te^{132}–I^{132} mixtures in, 9: 3754(J)

spontaneous tumors in, a literature survey, 9: 2545(J)

tissue distribution of P^{32} and I^{131} in anesthetized and stimulated rabbit, 9: 2544

x radiation dosage determinations, made on a phantom, 9: 3(R)

Rabbittites

occurrence in Lucky Strike No. 2, Mine, Emery Co., Utah, 9: 3829

Radiation

(See also specific radiations, e.g. Alpha particles and Beta particles; see also such headings as Accelerators; Cosmic radiation; Nuclear particles; Shielding, Thermal radiation.)

from absorbed fission products, pathological effects on plants, 9: 9

acquired resistance to, in mammalian systems, review, 9: 4043

activation of latent Bartonella muris infections in rats by exposure to, 9: 1164(J)

from atomic bombs, pathological effects on residents of Hiroshima and Nagasaki, statistical analysis, 9: 2535

biochemical effects of, review in Annual Review of Nuclear Science, 9: 3733(J)

biological effects, book, 9: 1719

biological effects of, compared with effects of drugs, 9: 3008

cataracts induced by exposure to, 9: 3722, 3723, 3724, 3725

chromosome aberrations produced by exposure to, effect of linear energy transfer, 9: 835(J)

clinical uses, late pathological effects, 9: 40(J)

comparison standards, 9: 1616(J)

contribution of surface dose of ionizing, to tissue doses, 9: 705(J)

data, handbook, 9: 2542(J)

detection and measurement of, kinetic nucleographic method for, 9: 712(J), 714(J)

dosage determinations of, based on effects of, rather than quantity of, at a point, 9: 320(J)

dosimetry of, following atomic disaster, performance of photographic roll film from local drugstores for, 9: 698

effects of exposure to, on carbohydrates, enzymes, lipids, and proteins, and sterilization of food by exposure to ionizing radiation, review of literature, 9: 2549

effects of exposure to, on latent period in bacteriophage, 9: 1160(J)

effects of, on brainstem and hypothalamus in primates, 9: 832(J)

effects of, on growth and salt absorption by bulbs, 9: 26(J)

effects of pile, on barley seed, 9: 3030(J)

immediate and late effects of total-body exposure to, on mammals, review, 9: 3368(J)

inactivation of bacteria by exposure to, effects of pretreatments and posttreatments, 9: 3743(J)

ionizing, effects of exposure on incidence of abnormal lymphocytes in mice and rats, 9: 1710

Radiation (cont'd)

lethal effects, of, on mice, rats, rabbits, dogs, guinea pigs, monkeys, and burros, 9: 2567(J)

lethal effects on vertebrates, review in Annual Review of Nuclear Science, 9: 3734(J)

lethal effects, variation with species, 9: 1720

leukemia induced by exposure to, in mice, 9: 4047(J)

measurement of, concepts of intensity and absorbed dose rate applied to, 9: 706(J)

mixed, from a nuclear explosion, biological effects on Neurospora, 9: 826(J)

mixed, from a nuclear explosion, biological effects of, on Tradescantia, 9: 823(J)

mixed γ and fast neutron, induction of pituitary tumors following exposure to, in mice, 9: 2559(J)

multiple scattering of nuclear, 9: 2029

mutations induced in protozoa by exposure to, 9: 1716(J)

permissible dosages from external sources of ionizing, handbook, 9: 1453(J)

from radioiodine, histopathological effects of large doses of, on thyroid gland of dogs, 9: 1169(J)

units and instruments used for detection, review, 9: 704(J)

"zipper" scattering chamber for, 9: 2394(J)

Radiation chemistry

(See also Radiochemistry.)

of aqueous ferrous sulfate-cupric sulfate solutions, 9: 2661(J)

asymmetry of action of H and OH in oxidation-reduction caused by ionizing radiations, 9: 1216(J)

chemical and industrial applications, 9: 579(J)

chemical effects of (d,p), (n,2n), and (γ,n) activation of I, 9: 1782(J)

effects of α particles on aqueous solutions, 9: 580(J)

effects of heavy-particle radiation on aqueous solution of acetic acid, 9: 2197

of hyaluronic acid and hyaluronidases, 9: 2659(J)

inhibitory action of Cl ions on the formation of H_2O_2 by α particles, 9: 581(J)

of olefins and acetylenes, 9: 2662(J)

oxidation of phosphites by α particles, 9: 582(J)

polymerization of ethylene and chlorination of benzene and toluene under γ radiation, 9: 1550

polymerization of n-vinylpyrrolidone by γ radiation, 9: 1781(R)

of pure organic compounds, 9: 102

review of new work and its significance in, 9: 103(J)

of water, yields of H_2O_2, effects of KCl and KBr on, 9: 2660(J)

yield variations with ionization density, studies with cyclotron beams, 9: 2200(J)

Radiation damage

(See also appropriate subheadings under units, materials, tissues, organs, etc., exposed to radiation; see also Radiation injuries.)

mechanism of irradiation disordering of alloys, 9: 4012(J)

techniques for study of, with cyclotrons, 9: 430(J)

Radiation detection instruments

(A complete instrument, not necessarily including the detector component; see also Radiation detectors; Radiological telemetering systems; Rate meters; Scalers.)

backscattering of electrons, 9: 684(J)

calibration, design of a γ source for, 9: 3923

calibration of high-range, facility for, 9: 2099(R)

circuits, 9: 2349(J)

components, failure rates, 9: 1329(J)

conductimetric and colorimetric, performance, 9: 4242(R)

description and availability of, used in England, 9: 296

Radiation detection instruments (cont'd)
design and performance, review, 9: 704(J)
design of, concepts of intensity and absorbed dose rate applied to, 9: 706(J)
for detecting α particles, performance, 9: 4048
for formation of visual images of ionizing radiations, design, 9: 2868(J)
lectures on elementary features of, 9: 294
for monitoring α and β particles, performance, 9: 4049
nonsaturable charged-foil type, for measurement of high-energy ionizing beams, 9: 3265(J)
portable, circuit design and performance, 9: 3930(R)
random dead time, theory, 9: 323(J)
sample changer for automatic radioactivity measurements with, 9: 3602(J)
saturation in, with high intensity x rays, 9: 1604
simplified apparatus for brain tumor surveys, 9: 1975(J)
survey of latest British, 9: 4251(J)
for use in prospecting and analyzing radioactive minerals, 9: 2431(J)
Radiation detection instruments (colorimetric)
utilizing acrylonitrile on CCl_4–benzene–indicator–sensitizer systems, 9: 2848(R)
Radiation detection instruments (ion current type)
automatic, for plotting isodose curves, 9: 1324(J)
charger for, performance of nuclear batteries as, 9: 2825(R)
design, performance, and charging, 9: 3587
design and performance of, for gamma measurement in high radiation fields, 9: 3926
design and performance of, of a pocket dosimeter for x and γ radiation with an enclosed self-charger, 9: 1328(J)
design of probe type, 9: 299
for direct β measurement, design, 9: 3937
performance of, for detection and measurement of β particles in determinations of the basis weight of fibrous materials, 9: 307(J)
a small CdS probe of high resolution for use with, design, 9: 1333(J)
Radiation detection instruments (pulse type)
for alpha, β, and γ monitoring of hands, feet, and clothing, design, 9: 3266(J)
alpha floor monitor, design, 9: 302
application to vapor phase analysis, 9: 2873(J)
automatic sampler and recorder for airborne contaminants, 9: 1325(J)
bromine-quenched and iodine-quenched G-M counters, design, 9: 3259(J)
calibration equipment for pile flux monitors, 9: 298
circuits, 9: 1319(J)
containing G-M tubes, performance, 9: 1041
for continuous monitoring of laboratory air and surface contamination, 9: 1977(J)
for cosmic ray measurements, design and performance, 9: 1301(J)
design, 9: 1611(J)
design, calibration, and performance of BF_3 thermal neutron detection channel, 9: 1316
design and characteristics of, 9: 295
design and performance, 9: 802
design and performance of, for counting Kr^{85}, 9: 300
design and performance of, for geologic field use, 9: 702(J)
design and performance of portable fast and slow neutron survey meter, 9: 306
design and performance of Savannah River plant α and γ scintillation counters, 9: 3925
design and performance of scintillation counters for γ rays above 50 Mev, 9: 1053(J)
design of, for C^{14} dating, 9: 3255(J)
Radiation detection instruments (pulse type) (cont'd)
design of, for selecting cosmic showers, 9: 3560(J)
design of, for thickness measurements of thin α-active layers, 9: 1236
design of very wide range proportional absorption counting system, 9: 2872(J)
effects of the semi-proportional region on the threshold of a Geiger-Mueller tube, 9: 1973(J)
effects of time-lag in Geiger counters, 9: 2849
employing on external cathode proportional detector, performance, 9: 1330(J)
fast coincidence counting system for high-energy particles, design, 9: 2416
fission counter design, 9: 1971(J)
geometric efficiency of cylindrical counters, 9: 2427(J)
integrating circuit for low count rates, 9: 710(J)
low-cost mechanical scanner, design, 9: 1323(J)
measurement of protons, deuterons, and α particles from photonuclear reactions, design, 9: 1037
for monitoring fast neutrons, design, 9: 3934
nonoverloading pulse amplifier for, design, 9: 2099(R)
performance and selection of, for routine radiometric analysis for U in ores, 9: 878
performance of a 4π β counter for scanning paper chromatograms, 9: 3263(J)
performance of, for determination of Zn^{65} in animal tissues, 9: 3379(J)
performance of, for quantitative determination of γ-emitting elements in living persons, 9: 3591(J)
performance of, in detection and measurement of thermal neutrons, 9: 1036
performance of self-quenching, with quenching circuits, 9: 693
portable battery-driven α monitor, design, 9: 3933
portable radon ionization chamber design, 9: 2855
pulse-height distribution analysis for low energies, 9: 1605(J)
resolution losses in, 9: 1047(J)
scintillation counter design, 9: 1067(R)
scintillation detector for carborne and airborne use, 9: 1321(J)
self-balancing, for the measurement of ionization ratios, design, 9: 3419(J)
sensitivity, methods for improving, 9: 1046(J)
stability problem and stabilizing circuit, 9: 2861(J)
transistor high voltage power supply for, 9: 1944
for use in radiological defense, design, 9: 2415
using a scintillation detector, design and performance, for measurement of β particles from C^{14}, 9: 701
well-type, use in measuring 2 or more radioisotopes in a liquid sample, 9: 2870(J)
Radiation detectors
large nuclear-emulsion block, construction of, 9: 1049(J)
(See also Chemical radiation detectors; Cherenkov detectors; Cloud chambers; Crystal detectors; Fission chambers; Geiger-Mueller tubes; Ionization chambers; Metal-foil detectors; Photoelectric cells; Photographic film detectors; Photomultiplier tubes; Pocket chambers; Proportional detectors; Radiation detection instruments; Scintillation detectors.)
bubble chambers, operation and characteristics, 9: 2425(J)
multiple scattering correction for, 9: 1117(J)
nuclear-emulsion embedded wires for use as, 9: 1052(J)
phantom measurements in thyroid studies, use in, 9: 1737(J)
radiation balance for colorimetric comparison of radium standards, 9: 1050(J)
random dead time, theory, 9: 323(J)
silver-activated phosphate glass for mapping gamma ray fields, 9: 3261(J)
use of plastic in preparing, 9: 2387(J)

Radiation effects

(See also appropriate subheadings under specific materials and organisms.)

biological, bibliography on, 9: 1720

chemical and industrial applications, 9: 579(J)

disordering of solids by neutrons, theory, 9: 4014(J)

effects of ionizing radiation on mutations, 9: 490(J)

in ionization, role of "subexcitation electron" in, 9: 2819(J)

on polymerization of plastics, 9: 1785(J)

x-ray analysis of, 9: 2496

Radiation exposure chambers

with controlled atmosphere, design, 9: 480(R)

design and calibration of a 100 curie, using Co^{60}, 9: 3896(J)

rat irradiation, dosimetric study of experimental facility for, 9: 2099(R)

Radiation injuries

(See also appropriate subheadings under organisms, organs, and Radiation and specific radiations; see also Radiation damage; Radiation sickness.)

from atomic explosions, effects on residents of Hiroshima and Nagasaki, summary, 9: 3745(J)

of barley seed, effects of CO_2, O and low temperature on, 9: 2593(J)

biological effectiveness of high and low intensity x radiation on Drosophila, 9: 3029(J)

chemical prophylaxis with cholinergic drugs and mercurial diuretics, and effects of temperature on in rats, 9: 2548(R)

chemical prophylaxis with thiourea derivatives and 2,4-dinitrophenol, negative results in mice, 9: 480(R)

of chromosomes, effects of pre- and post-irradiation centrifugation, 9: 842(J)

of connective tissues in rats, 9: 492(J)

delayed, from clinical use of Ra chlorides and Th oxides and from ingestion of Ra and Th isotopes, 9: 40(J)

determination, by determination of urinary desoxyribonucleases in rats, 9: 23(J)

determined by weight loss in mice, 9: 477

effects of bio-flavonoid therapy on, in cancer patients, 9: 839(J)

effects of cortisone on, in adrenalectomized and non-treated mice, 9: 838(J)

effects of cysteine on, in Drosophila, 9: 3371(J)

effects of granulocyte count and litter on survival following, in mice, 9: 39(J)

effects of increased environmental temperature on, in rats, 9: 480(R)

effects of injected bone marrow on, in mice, 9: 2597(J)

effects of injected pituitary growth hormone on, in mice, 9: 1721(J)

effects of premedication with chlorpromazine on, in mice, 9: 3747(J)

effects of prophylactic and therapeutic doses of cortisone on, in rats, 9: 2591

of eggs of Habrobracon, effects of oxygen on, 9: 2592(J)

of eyes, produced by atomic flash, 9: 3026(J)

of hematopoietic cells of tadpoles, effects of anoxia on, 9: 1448(J)

of hematopoietic system in dogs and rats, 9: 3739(J)

incidence of leukemia among atomic bomb survivors in Hiroshima, 9: 2586(J)

induction of cataracts by exposure to β particles of man and rabbits, 9: 2118(J)

of intestine, bacterial infection following, in mice, 9: 2553(J)

of mice, effects of injections of rat bone marrow administered with and without cortisone, 9: 4051

prophylactic effects of cysteamine against, in mice, 9: 2121(J)

prophylaxis of, with blood serum and plasma proteins in mice, 9: 3(R)

protection of guinea pigs to x radiation by chemical reduction of metabolism, 9: 43

Radiation injuries (cont'd)

protective effects of blood proteins against, in mice, 9: 2598(J)

protective effects of CO, KCN, and H_2S, 9: 2599(J)

protective effects of cysteine against, 9: 3035(J)

protective effects of cysteine, mechanism, 9: 2601(J)

protective effects of granulocytes in, 9: 1720

protective effects of homogenates of bone marrow or spleen against, in mice, 9: 2596(J)

protective effects of injected spleen and bone marrow homogenates against, in mice, 9: 3370

protective effects of inorganic Mg against, in Hydra, 9: 41(J)

protective effects of phenolic and naphtholic derivatives, glucosamine, and liver homogenates against, in mice and rats, 9: 2595(J)

protective effects of spleen homogenates against, effects of storage on, in mice, 9: 2594(J)

protective effects of spleen homogenates against, in mice, 9: 2600(J)

protective effects of thiourea and thyroxine against x radiation in mice, 9: 3034(J)

radiation protection in adult mice by bone marrow grafts, 9: 841(J)

relationship to blood plasma lipid levels in rabbits, 9: 25(J)

of skin, detection by inflammatory response, 9: 830(J)

of survivors of atomic explosion in Hiroshima, effects of distance, 9: 3366(J)

syndrome, in germ-free rats, 9: 2546

therapeutic effects of spleen and bone marrow on, 9: 837(J)

therapeutic effects of spleen homogenates against, in mice, 9: 38(J)

therapy in mice using d, 1-α-octadecylglycerolether, 9: 1454(J)

therapy of radioinduced leukopenia with alkoxyglycerols, 9: 1485(J)

therapy, with beef embryo extract, in mice, 9: 37

therapy with heterologous spleen extracts, negative results, 9: 3033

therapy, with injections of bone marrow, 9: 18

from thermal neutrons, in mice, 9: 20(J)

of thyroid gland of rats, effects of hypophysectomy and thyroxine, 9: 2113(J)

Radiation Lab., Univ. of Calif., Berkeley

progress reports from Physics Div., 9: 3966(R)

progress reports from Chemistry Division, 9: 61(R)

progress reports on Bevatron operation and development, 9: 3864(R)

progress reports on medical and health physics, 9: 2551(R)

progress reports on medical research, 9: 3730(R)

Radiation monitoring

(The monitoring of radioactivity in work areas, etc.; for monitoring of personnel see also Radiation protection.)

of alpha radiation, performance of instruments, 9: 3268(J)

of floors, performance of a portable survey meter for, 9: 1315

handbook, 9: 3928

of hands, feet, and clothing for β, α, and γ contamination, design of a single unit for, 9: 3266(J)

scintillation counter for atmospheric, 9: 1045(J)

Radiation phantoms

(See Phantoms.)

Radiation protection

(General aspects of the problem concerning personnel; see also Health physics; Radiation detection instruments; Remote-control equipment; Shielding.)

administrative problems in, on federal, state, local, and industry levels, 9: 840(J)

against radiations from Ra, Co^{60} and Cs^{137}, handbook, 9: 1452(J)

Radiation protection (cont'd)

anthology of data, 9: 3746

around a Co^{60} beam therapy installation, 9: 2129(J)

during diagnostic radiology, 9: 3372(J)

during industrial radiography with radioisotopes, 9: 2589

during therapeutic radiology, 9: 3373(J)

film and counter techniques, 9: 42(J)

at Hanford, review, 9: 1722(J)

in laboratories handling α and β particles, 9: 4049

of personnel performing autopsies on radioactive cadavers, 9: 44(J)

in a radiochemistry laboratory, 9: 576(J)

for radiographic rooms, 9: 2047(J)

the role of education in, 9: 2122(J)

shield wall stabilization, 9: 3345

Radiation Research Corp.

progress reports on radioactive dosimeter charger, 9: 2825(R)

Radiation sickness

(See also Radiation injuries.)

etiology of, effects of dose received by radiosensitive organs and tissues, 9: 3018(J)

prophylaxis and therapy of, using β-mercaptoethylamine, 9: 3036(J)

prothrombin levels associated with, effects of blood platelets, 9: 3363

therapy of, with corticotropin, 9: 2123(J)

Radiation sources

(See also specific sources, e.g., Neutron sources; see also Radioapplicators.)

in cylindrical containers, surface dosage rates, 9: 3212

inelastic β-e^- diffusion effects in, 9: 2040(J)

mathematical analysis of flux emission from cylindrical, 9: 779

portable, remote-controlled radiographic Ir^{192}, 9: 3901(J)

preparation and certification of standards for β and β-γ emitters, 9: 4019(J)

shielding design, 9: 3345

from spent MTR fuel rods, cost factors, 9: 3122

standards produced by the National Bureau of Standards, 9: 2513(J)

Radiation target cans

opening, remote-control equipment for, 9: 661(J)

procedure for opening and handling, 9: 564(J)

Radiation target theory

applied to radioinduced inactivation of infectivity and hemagglutination properties of influenza virus, 9: 2106

Radiation targets

backscattering from Mg, C, Be, and Li, bombarded by 1- and 2-Mev electrons, 9: 2041(J)

liquid H, D, and He, for use with high-energy accelerators, 9: 2469(J)

preparation of thin C and O, on Ni foils heated with focused light from 1000-w electric lamp, 9: 242(J)

styrofoam hydrogen, having a liquid N heat shield, design, 9: 654

Radioactive contamination

(See also appropriate subheadings under materials and units contaminated; see also Decontamination; Stack disposal; Waste disposal.)

from slab of contaminating material, mathematical analysis, 9: 3935

Radioactive materials

catalog of, 9: 346(J)

design and function of a general-purpose overhead manipulator for, 9: 606(J)

liquid, sampler for, design, 9: 1424(P)

Radioactive materials (cont'd)

safe handling, 9: 4098(J)

sample changer for automatic radioactivity measurements on, 9: 3602(J)

trapping of splashes from boiling, design of apparatus for, 9: 1779

Radioactive minerals

(See also specific radioactive minerals, e.g., Pitchblendes; see also ores of radioactive minerals, e.g. Uranium ores.)

bibliography on, 9: 2272(J)

instruments used in prospecting and analyzing, 9: 2431(J)

prospecting for, by nuclear methods, book, 9: 2715(J)

surface radioactivity detection by photographic plates, 9: 2707

variations in isotopic abundances on Ne and A extracted from, 9: 626(J)

Radioactivity

(See also appropriate subheadings under specific isotopes, elements, and radiations.)

aspects in geology and cosmology, 9: 2265(J)

buildup in nonequilibrium conditions, graphs for, 9: 443(J)

capture-positron branching ratios, theory, 9: 1674

computation of growth of decay products, 9: 2054

concept of parentage of nuclear states in, 9: 3645(J)

discovery of artificial, history of, 9: 1401(J)

disintegration rates by 4π counting, 9: 3603(J)

induced by thermal neutrons, tables for simplifying calculations of formation and decay, 9: 2514(J)

isotopic spin selection rule for electric dipole transitions, 9: 4325(J)

matrix elements in, 9: 1423(J)

matrix elements in superallowed transitions, 9: 2997(J)

measurement with x-ray films, 9: 2432(J)

natural, effect on thermal regime of earth, 9: 2796(J)

natural, of man, contribution of K^{40} and Ra to, 9: 444(J)

natural, search for new and extinct, 9: 953(J)

occurrence in granites, limestones, bentonites, building materials, ground waters, and plants, 9: 445(J)

review of recent studies, 9: 3631(J)

scaler for measurement of half lives in range 3 sec to 30 min, 9: 2430(J)

Radioapplicators

using $Cobalt^{60}$, for treatment of cervical carcinoma, design, 9: 4053(J)

containing $cobalt^{60}$, effectiveness, as a substitute for Ra as a β radiotherapy source, 9: 843(J)

Radioautography

measurement of relative radioactivity, 9: 2432(J)

preparation of samples of undecalcified bone, 9: 2547(R)

quantitative β-track, of single cells, 9: 1734(J)

of thyroid gland, following administration of I^{131}, in mice, 9: 1170(J)

Radiobiology

apparatus giving α-particle microbeam for irradiation of living cells, 9: 2397(J)

book on, 9: 1719(J)

intussusception in pericarp of spring rye, x-ray and Ra effects, 9: 2563(J)

of ultraviolet radiation, book, 9: 4046(J)

use of scintillation counters in, review, 9: 1035

vertebrate, lethal effects, review in Annual Review of Nuclear Science, 9: 3734(J)

Radiochemistry

application of, in industry, conference, 9: 3807(J)

equipment, 9: 576(J)

equipment for remote chemical separations, 9: 570(J), 571(J)

organic materials suitable for use in, 9: 107

Radiodiagnosis
influence of liver diseases on thyroid-uptake of I^{131}, 9: 499(J)
of thyroid conditions by early differential uptake and renal excretion of I^{131}, 9: 1463(J), 1464(J)
of thyroid diseases, by uptake of I^{131} following administration of desiccated thyroid, 9: 507(J)
Radiography
application to oil storage problems, 9: 1819(J)
automatic exposure controller for use during, design, 9: 1456
calibration of diagnostic x rays for use in, 9: 3374(J)
dosage to walls during, 9: 2047(J)
evaluation of xeroradiography, 9: 3816
fast, self-developing film for, 9: 2099(R)
feasibility of using a compact unit operating at four million volts, 9: 1368
gamma, inspection of pipeline welds by, 9: 4136(J)
gamma and x-, relative merits of, 9: 3817(J)
industrial, evaluation of Polaroid Radiographic Packet No. 1001, 9: 143
industrial, with radioisotopes, radiation safety, 9: 2589
principles, equipment, and potentialities of xeroradiography, 9: 1171(J)
as service performed by hot lab, 9: 610(J)
Radioisotopes
(See also specific isotopes; see also Fission products.)
angular correlation measurement techniques, 9: 2901(J)
application to measurement techniques, review, 9: 1334(J)
buildup and decay factors, nomogram, 9: 4021(J)
catalog of, 9: 246(J)
compounds labeled with C^{14}, bibliography, 9: 1488
computation of growth of decay products, 9: 2054
conference on medical and physiological applications, 9: 3719(J)
determination of, by measurement of time intervals between disintegration, 9: 1128(J)
determination of, by the distribution of intervals between disintegration, 9: 2966(J)
half life for low activities of short-lived, calculation, 9: 4022(J)
half life measurements, 9: 2960(J)
half lives, determinations on small samples, 9: 4331(J)
industrial applications, conference, 9: 3807(J)
industrial applications of, 9: 612(J)
industrial radiography with, radiation safety, 9: 2589
ionization by, and industrial uses, 9: 3208(R)
of medical interest, preparation and tissue distribution, 9: 1725(J)
produced by a synchrocyclotron, study of, 9: 768(J)
produced by (n,γ) reactions, separation by recoil nuclei method, 9: 1958(J)
produced by thermal neutrons, tables for simplifying calculations of formation and decay of, 9: 2514(J)
production rates in cyclotron, 9: 3245(J)
scintillation counting of mixtures of, 9: 2870(J)
short lived, production in low-power reactor, 9: 1953(J)
standards for US production, 9: 1311(J)
table of total β disintegration energies, 9: 805(J)
as tracers in biological research, manual for, 9: 510(J)
use in tracing sewage flow, 9: 613(J)
utilization in industry and engineering, 9: 611(J)
Radiological defense
(See also Civilian defense.)
safety and lethal effects of atomic explosions, 9: 469(J)
Radiological Lab., Univ. of Calif, San Francisco. School of Medicine
progress reports. 9: 1723(R)
Radiological telemetering systems
for monitoring atmospheric radioactivity, design, 9: 1068
Radiology
diagnostic, radiation protection problems, review, 9: 3372(J)
handbook, 9: 3542(J)
therapeutic, radiation protection problems, review, 9: 3373(J)
workers in the field of, congential malformations in offspring of, a statistical analysis, 9: 3025(J)
Radiolysis
(See Radiation chemistry.)
Radiometric analysis
application of γ spectroscopy to, 9: 874(J)
equipment for determination of U in U ores, 9: 878
fiducial limits for net activity, 9: 1034
of gases, techniques and equipment, 9: 300
neutron-activation analysis of Na in Al alloys, 9: 1304(J)
of papergrams in determinations of radiochemical purity, 9: 3262(J)
preparation of samples containing α and soft-β emitters dissolved in salt solution, 9: 3730(R)
procedures for separation and decontamination of fission mixtures, 9: 2634
recognition of radiochemical purity using Al absorption curves, 9: 4244
sample preparation using small amounts of carrier, 9: 3676(J)
Radiosensitivity
(See also appropriate subheadings under specific organs, organisms, and materials.)
of developing Artemia, effects of hydration, 9: 3741(J)
effects of nutritional factors on, of yeast, 9: 3364
factors influencing, in mammalian systems, review, 9: 4043
of malignant tumors, 9: 3017(J)
of mammalian cells, 9: 3015(J)
of somatic cells, factors affecting, 9: 831(J)
tolerance to anoxia following total-body exposure to x radiation in guinea pigs, variations with altitude, 9: 2110
of tumors, effects of vitamin C-free diet on, in laboratory animals and man, 9: 3043(J)
Radiotherapy
blood-drop determination of Au^{198} in prostate, 9: 3750(J)
of brain tumors, with implants of radioactive gold particles, 9: 2127(J)
of bronchial carcinoma using Co^{60}, 9: 1163(J)
of carcinoma of ovaries, pleura, and peritoneum using Au^{198}, 9: 1162(J)
case history of leukemia in a patient with thyroid carcinoma treated with I^{131} and x radiation, 9: 3019(J)
of cervical carcinomas, Co^{60} applicator, design, 9: 4053(J)
of cervical carcinomas using Co^{60}, dosimetry, 9: 4052(J)
conference on new techniques, 9: 3719(J)
conversion of a radium beam unit for housing for a Co^{60} unit for therapeutic uses, 9: 3125(J)
design of a Co^{60} teletherapy unit for, 9: 497(J)
of effusions associated with carcinomas, using colloidal Au^{198}, 9: 1175(J)
electron filter for a Co^{60} γ beam, 9: 3040(J)
employing internally administered β sources, radiation dosimetry, 9: 498(J)
equipment for infusion of colloidal radiogold, 9: 2804(J)
integral dose measurements on a Co^{60} teletherapy beam, 9: 1979(J)
an isotope survey couch, design, 9: 2128(J)
of malignant tumors, review, 9: 3044(J)

Radiotherapy (cont'd)

optical systems for adjustment of the skin distance for in vivo measurements following administration of radioisotopes, 9: 688(J)

of pituitary dysfunctions, influence of irradiation of hypothalamus on, 9: 833(J)

preparation and tissue distribution of radioisotopes for use in, 9: 1725(J)

preparation of phantoms for planning, 9: 1727(J)

with radium chlorides and Th dioxide, late pathological effects, 9: 40(J)

rotating telecobalt unit for, dose distribution and protection requirements, 9: 1726(J)

scattered radiation from a Co^{60} beam therapy unit, 9: 2129(J)

skin cancers following, 9: 32(J)

of skin tumors using x radiation, effects of inhalation of oxygen on, 9: 2134(J)

slide rule nomograms for Co^{60}, 9: 3042(J)

of thyroid cancer with I^{131}, γ isodose measurements over entire body, 9: 2605(J)

of thyroid carcinomas, uptake of I^{131} in, 9: 500(J)

of thyroid diseases, uptake of I^{131} in, counting method, 9: 46(J)

of thyroid diseases with I^{131}, prediction of uptake based on uptake of tracer dose, 9: 45(J)

of thyroid diseases using I^{131}, relationship between clinical response and distribution of I^{131} in thyroid and blood serum components, 9: 1460(J)

tissue distribution of colloids of Au^{198}, P^{32} and Y^{91}, 9: 1459(J)

the use of Co^{60} as a substitute for Ra, 9: 843(J)

using betatron-produced high-energy x rays and electron beams, 9: 1724(J)

using colloidal Au^{198}, optimum sites of injection and lymph node concentration, 9: 1457(J)

using radioiodine, calculation of blood radiation dose, 9: 1173(J)

using x radiation, Ra, and radioisotopes, book, 9: 1458

using x radiation or P^{32}, comparison of results in chronic leukemia, 9: 3037(J)

Radium

body burden determinations for, 9: 2539(R)

comparison of radiation from ampoules of, 9: 1616(J)

contribution of, to natural radioactivity of man, 9: 444(J)

decay schemes and conversion electrons, 9: 383(J)

determination of, in minerals with proportional counters, 9: 957(J)

electrochromatographic separation of, from principal radioactive daughters and Ba, 9: 4106(J)

exchange with Ca in prototype bone apatite, 9: 847

gamma emission, energy measurement by secondary electron absorption, 9: 809(J)

in vivo determination of small amounts of, in human skeleton, 9: 1980(J)

ingestion of, by luminous dial workers, late pathological effects, 9: 40(J)

ion exchange of, from Th at high temperatures, 9: 593(J)

precipitation from U ore concentrates, 9: 3155(J)

precipitation of, with $BaSO_4$, 9: 1207(J)

protection against radiation from, handbook, 9: 1452(J)

separation from natural products by paper chromatography, 9: 909(J)

standards, comparison of four national, experimental procedures for, 9: 1129(J)

standards, radiation balance for comparison of, 9: 1050(J)

standards, statistical analysis of comparisons of four national, 9: 1130(J)

therapy, skin cancer following, 9: 32(J)

toxicology of, for lambs, 9: 1156(R)

Radium chlorides

clinical uses, late pathological effects, 9: 40(J)

Radium isotopes Ra^{223}

decay, intensity of conversion electron spectrum following, 9: 2975(J)

half lives, 9: 3952

Radium isotopes Ra^{224}

concentration of, in drinking water of the Chicago and Frankfurt am Main, Germany, areas, 9: 3231(J)

Radium isotopes Ra^{225}

radioactivity, 9: 2500

Radium isotopes Ra^{226}

concentration of, in drinking water of the Chicago and Frankfurt am Main, Germany, areas, 9: 3231(J)

energy levels, 9: 2897(J)

excretion, following simultaneous injection with Ca^{45}, 9: 2547(R)

quantitative determination of γ radiation from internally deposited, in dogs, 9: 3591(J)

separation of, facilities for, design, 9: 552(J)

Radon

assay, simplified scintillation counter for, 9: 2874(J)

in concrete, release in radiant heating, 9: 2066(J)

detection and measurement with portable ionization chamber apparatus, 9: 2855

determination of, 9: 2539(R)

exposure unit for small animals, 9: 1728

inhaled, quantitative determination of γ radiation, 9: 3591(J)

injected, biological effects of α particles from, in mice, 9: 2564(J)

physiological effects, toxicology, and bibliography, 9: 3010

Radon isotopes

alpha decay in, relation to shell model, 9: 1999(J)

Radon isotopes Rn^{222}

half life, 9: 2960(J)

Rain water

radiometric analysis of, for naturally occurring Be^{7}, 9: 3655(J)

Raleigh

meteorological conditions at affecting dispersal of smoke from reactor, stack, 9: 3978

Raman effect

applications of, to intermolecular interactions, review, 9: 1339(J)

intensity of lines in, calculation by the method of orbitals, 9: 2887(J)

Rare earth alloys

room- and elevated-temperature mechanical properties and heat treatment, 9: 3840(R)

Rare earth complexes

with ethylenediaminetetraacetic acid and cyclohexanediamine-tetraacetic acid, relationship between structure and spectra in, 9: 1217(J)

formed by addition of methylamine to rare earth(III) chlorides, 9: 3867(J)

Rare earth compounds

with cyclopentadiene, 9: 3096(J)

Rare earth deposits (Calif.)

occurrence in Mountain Pass District, 9: 3837(J)

Rare earth ions

excited states of, operator equivalents and matrix elements for, 9: 2977(J)

Rare earth–magnesium alloys

preparation, annealing, and electron-diffraction analyses, 9: 4160(R)

Rare earth–magnesium–manganese alloys

preparation, annealing, and electron-diffraction analyses, 9: 4160(R)

Rare earth–magnesium–zirconium alloys

preparation, annealing, and electron-diffraction analyses, 9: 4160(R)

Rare earth oxalates

solubility products, 9: 1218(J)

Rare earth oxides

heat and free energy of formation, 9: 529(J)

Rare earth sulfates

instability constants of complex, 9: 1218(J)

symmetry of local crystalline field about ions in $Nd_2(SO_4)_3 \cdot 8H_2O$ crystals, 9: 2981(J)

Rare earths

(See also specific elements.)

absorption spectra, transitions between states and quantum numbers for excited states from, 9: 2979(J) 2980(J)

chromatographic separation of, on paper impregnated with ion-exchange resins, 9: 3108(J)

determination in U by ion exchange, 9: 884(J)

determination in U by ion exchange, 9: 1793(J)

fractional crystallization of, by precipitation of Mg nitrate salts, effects of method on effectiveness, 9: 115(J)

ion exchange of, effect of amino polyacetic acids and exchanger form on, 9: 113(J)

neutron resonances, 9: 1132(J)

paramagnetic resonance in, theory, 9: 2074(J)

radiometric determination, 9: 2634

rapid extraction of La oxide from, with nitric acid and NH_3 gas, 9: 902(J)

rapid separation of, by ion exchange with lactic acid as eluant, 9: 3427(J)

recovery from monazite sands, 9: 592(J)

separation and analysis by paper chromatography, 9: 584(J)

separation and estimation of Th from, 9: 594(J)

separation of, from low-alloy construction steels, bibliography, 9: 4104

separation of ThO_2 from, using urotropine, 9: 3431(J)

separation of, using (ethylenediamine)tetraacetic acid, 9: 3428(J)

Rare gases

(See also specific elements.)

charge transfer cross sections of protons, H ions and He ions in, 9: 2806(J)

exchange of vibrational and translational energy between, and excited iodine molecules, 9: 3571(J)

purification by active metals, 9: 2382

Rate meters

(See also Radiation detection instruments (ion current type.)

circuits for neutron survey equipment, design, 9: 3250

design, for accurate measurement of pulse repetition frequency, 9: 711(J)

design, for scintillation spectrometers, 9: 696

for detection and measurement of γ radiation, calibration, 9: 1602(J)

for distinguishing Pu from U, design, 9: 1598

general purpose log counting rate meter, design, 9: 1317

portable, performance as floor monitors, 9: 1315

for use in radiological defense, design, 9: 2415

Rats

lethal dosage determination of radiation for, 9: 1720

lethal effects of radiation, 9: 2567(J)

metabolism of $Te^{132}-I^{132}$ mixtures in, 9: 3754(J)

spontaneous tumors in, a literature survey, 9: 2545(J)

Ray-Welch-Willmore Claims (Calif.)

geology and mineralogy, 9: 3837(J)

Reaction mechanisms

gas phase, automatic pressure recorder for study of, 9: 2834(J)

panoramic mass spectrometer for chemical kinetic studies, 9: 2407

rate theory and homogeneous reactions, review, 9: 3062(J)

Reactor control rods

comparison of theories of, 9: 2910(J)

effectiveness in water-moderated reactors, theory, 9: 4285

gas seal for, design and testing, 9: 3121

neutron capture and scattering analysis, 9: 346

Reactor control systems

automatic, design of, 9: 1082(J)

Reactor coolants

liquid metal, bibliography, 9: 1080

Reactor engineering

liquid metals in, application, 9: 3643(J)

Reactor experimental facilities

radiation dosages from MTR γ irradiation facility, 9: 2050

Reactor fuel alloys (liquid)

testing of U–Bi alloy on stainless steel, 9: 3285

Reactor fuel elements

cladding for Na-cooled fast, tests of Globeiron for, 9: 2776(J)

calculations of shielding for handling of burned-out, 9: 2984

interlocking plate for charging dissolver of, 9: 587(J)

irradiated, facilities for handling, 9: 577(J)

processing, remote-control equipment for, design, 9: 550(J)

remote sampling by electrolytic drilling, apparatus and procedure, 9: 3862

reprocessing methods for recovery of uranium and plutonium, 9: 3289(J)

Reactor fuel rods

neutron capture and scattering analysis, 9: 346

production from U and UO_2, 9: 3711(J)

Reactor materials

(See also appropriate subheadings under specific reactors; see also specific materials.)

composition, preparation, properties, and testing of ceramic coatings for high-temperature alloy parts as, 9: 2249(J)

Reactor matrices

diffusion parameters of thermal neutrons in H_2O, 9: 1387(J)

neutron density analysis, 9: 346

Reactor moderators

hydrogenous, neutron age and slowing down in, 9: 2927

neutron scattering analysis, 9: 346

Reactor oscillators

design, for neutron absorption cross sections, in BEPO, 9: 694

Reactor reflectors

energy-dependent albedo, 9: 4300

Reactor safety

AEC inspection program for, 9: 3290(J)

Reactor shielding

gamma attenuation in 2π shield, 9: 2030

gamma scattering in a shadow shield, 9: 2027

photoneutron production in, containing C, 9: 2516(J)

Reactor simulators

(See also Computers.)

design and performance of HRE, 9: 371

Reactor simulators (cont'd)

electric circuit analog for neutron diffusion, 9: 3287

electric circuits and analysis, 9: 2014(J)

Reactors

(See also specific reactors by name.)

adaptation of multigroup methods to cylindrical geometries, 9: 369

amplifiers for control of, development of, 9: 1308(J)

calibrating equipment for flux monitors, 9: 298

ceramic coatings for use in, 9: 1253(J)

control, 9: 3295(J)

design and construction of, for industry and universities, 9: 1643

design of a gamma-measuring ion chamber for use in, 9: 3926

effect of positive temperature coefficient on stability and transfer function, 9: 3286

gamma decay after shutdown, 9: 3977

German, regulations and problems concerning, and physics summary for, 9: 3640(J)

kinetic effects of delayed neutrons, 9: 3642(J)

kinetics, effects of delayed neutrons and temperature, 9: 3975

kinetics of, with reflectors, using two-group model of neutron multiplication, 9: 375(J)

multigroup approximation to Boltzmann equations for criticality computations, 9: 2447

neutron flux depression by foil detectors, 9: 3291(J)

neutron flux measurements, 9: 318(J)

neutron spectra, 9: 1085(J)

nitrogen fixation in, 9: 3094(J)

nomographs for calculation of hazards from nuclear incident, 9: 36(J)

operating principles, cost, safety, and uses of research, 9: 2448(J)

power level measuring equipment, 9: 2909(J)

power variation with increased reactivity, 9: 3974

safe operation of, AEC inspection program, 9: 3290(J)

separation of U, Pu, and fission products from nuclear fuels, 9: 591(J)

Recapture Member (Ariz.)

geology, 9: 1828

Red Canyon District (Utah)

mineralogy, 9: 1829

Red Canyon Quadrangle (Colo.)

geology, preliminary map of, 9: 1262(J)

Red Desert Area (Wyo.)

stratigraphy and U distribution in, 9: 2263

Reduction

electro-, of anions, theory, 9: 856(J)

radioinduced, asymmetry of action of H and OH radicals in, 9: 1216(J)

Reflection

differential spectrophotometric measurement of, in chromatography, 9: 3395(J)

Reflectometers

design, for use in range 0.4 to 2.6μ, 9: 2521(J)

Refractories and crucibles

(See Ceramic materials.)

Refractory materials

(See also specific materials; see also Ceramic materials.)

eutectic sintering of cemented metal-base, formation and disruption of skeleton during, 9: 2250(J)

metallurgical evaluation, for molten Ti crucibles, 9: 2246, 2247, 2248

preparation and thermal conductivity, 9: 946(R)

production, cost factors, and uses of zirconia, 9: 151(J)

reaction of Th with, at high temperatures, 9: 1247

Remote-control equipment

(See also Laboratory equipment; Servomechanisms.)

automatic liquid sampling system, 9: 568(J)

for chemical separation, design, 9: 570(J), 571(J)

crane and fork-lift designs, 9: 561(J)

design, 9: 555(J), 556(J), 557(J), 1436(P)

design and function of a general-purpose overhead manipulator for radioactive materials, 9: 606(J)

design of, for chemical operations on 1 to 2 curies of $\beta-\gamma$ activity, 9: 97

design of, for handling frangible radioactive articles, 9: 1441(P)

design of, for remote metallography, 9: 562(J)

design of metallograph, 9: 2194

for disassembling circulating loop exposed in Low Intensity Training Reactor, 9: 752(J)

for handling irradiated fissionable materials, 9: 577(J)

for handling irradiated fuel-specimen capsules, 9: 564(J)

for hot metallography, 9: 563(J)

mobile shield for cyclotron target removal, 9: 810(J)

for opening irradiated samples, 9: 661(J)

for pipetting micro-amounts, design, 9: 559(J)

for the preparation of γ sources, 9: 572(J)

for preparation of neutron sources, 9: 573(J)

for processing reactor fuel elements, design, 9: 558(J)

for radiochemistry procedures, 9: 576(J)

for radiometallurgy laboratory, design, 9: 575(J)

sampler for radioactive liquids, 9: 1424(P)

sampling metallic solids by electrolytic drilling, 9: 3862

for solid-state laboratory, design, 9: 574(J)

stereoscopic periscopes for use with, 9: 566(J)

storage and sampling unit, large-scale automatic, 9: 569(J)

for studies of physics and metallurgy of radioactive materials, 9: 578(J)

for welding stainless steel tubes, design, 9: 631

Rensselaer Polytechnic Inst.

progress reports on aluminum powder metallurgy, 9: 4164(R)

Research and Development Branch, Industrial Group, Windscale Works, Dept. of Atomic Energy, Windscale, Cumb. (England)

progress reports on fabrication of plastics, 9: 3760

Research Inst., Temple Univ.

progress reports on high-temperature research on metals, 9: 57(R) 3498(R)

Research Lab., Allegheny Ludlum Steel Corp.

progress reports on wrought and cast high-temperature alloys, 9: 2720(R)

Research Lab. of Electronics, Mass. Inst. of Tech.

progress reports, 9: 652(R) 4210(R)

Resins

(See also Adhesives; Ion exchange materials; Plastics.)

activity of measurements of Ca, Mg, Na, and K ions in electrolytic solutions with resin membrane electrodes, 9: 2149(J)

anion activity measurements of chloride, sulfate, and La ions with membrane electrodes of anion-exchanging, 9: 2150(J)

deuterization of, for use in separating boric acid from D_2O, 9: 3097

ion exchange, heat of wetting of, 9: 2210(J)

properties, 9: 3795(R)

swelling of, in mixtures of water and methanol, ethanol, isopropyl alcohol, and dioxane, 9: 1750(J)

Resistance thermometers

design and performance of metal-film, for measuring surface temperatures, 9: 3132(J)

Resistors
life of, in radiation detection instruments, 9: 1329(J)
Resonators
(See Cavity Resonators.)
Respiration
role of, in oxygen effect in x-irradiated bacteria and yeasts, 9: 24(J)
Respirators
having an automatic electronically controlled respiratory cycling valve, design, 9: 3359
Respiratory cycles
oxygen consumption, effects of total-body irradiation and of diet in burros, 9: 2572(J)
Reticulo-endothelial system
effects of intravenously injected P^{32} β particles on, 9: 1717(J)
Reynolds Robbins Claims (Calif.)
geology and mineralogy, 9: 3837(J)
Rhenium
ion exchange separation of, from Mo, 9: 1223(J)
natural radioactivity, 9: 804(J)
preparation, fabrication, and physical, mechanical, and electronic properties, 9: 2722(R)
preparation, fabrication, electroplating, physical, chemical, mechanical, and electronic properties, and microstructure, 9: 976
radiometric determination, 9: 2634
spectrographic determination of, in ores and rocks, 9: 162
Rhenium–barium aluminate compacts
electronic properties, 9: 2722(R)
Rhenium–barium carbonate compacts
fabrication of cathodes, 9: 976
Rhenium–barium carbonate electrodes
performance, 9: 976
Rhenium–barium carbonate–strontium carbonate compacts
fabrication of cathodes, 9: 976
Rhenium isotopes Re^{185}
formation, by decay of W^{185}, 9: 2965(J)
life time of first excited state, upper limit of, 9: 1072(J)
Rhenium isotopes Re^{186}
first-forbidden nonunique β spectra, 9: 4330(J)
thyroidal accumulation, 9: 4039(R)
Rhenium isotopes Re^{188}
thyroidal accumulation, 9: 4039(R)
Rhenium oxides
heat and free energy of formation, 9: 529(J)
Rhenium–thorium alloys
fabrication and microstructure of arc-melted, 9: 976
Rhenium–thorium oxide compacts
fabrication, mechanical properties, microstructure, and thermionic emission, 9: 976
Rhodium
adsorption of O_2, H_2, and CO on evaporated films of, 9: 2159(J)
determination of, as sulfide, 9: 82(J)
film-surface area of evaporated, measurement, 9: 3887(J)
radiometric determination, 9: 2634
Rhodium isotopes Rh^{102}
decay by electron capture, 9: 2954(J)
gamma spectra, 9: 2958(J)
Rhodium isotopes Rh^{103}
energy levels, 9: 1408(J) 2970(J), 3342(J)
Rhodium isotopes Rh^{105}
decay scheme, 9: 2955(J)
half-life determination, 9: 4205(R)
Rhodium isotopes Rh^{107}
half-life determination, 9: 4205(R)
Rhodium–platinum alloy–platinum couples
calibration of, against standard Pt resistance thermocouples, 9: 185
Rhyolitic Tuff Deposit (Nev.)
uranium distribution, 9: 1524
Ribonucleic acid, desoxy-
birefringence, 9: 2164
Ribonucleic acid, desoxy-, sodium salts
proton magnetic resonance line broadening in aqueous, 9: 2151(J)
self diffusion of water in aqueous solutions of, hydration data computed from, 9: 2151(J)
Richardson Basin District (Utah)
mineralogy, 9: 1829
Rock Creek Prospect (Alaska)
exploration, 9: 628(J)
Rock drilling
equipment for, 9: 624
statistical analysis of, on Colorado Plateau, 9: 624
Rocks
(See also Carbonaceous rocks.)
age determination by potassium-argon decay, 9: 625(J)
atmospheric β ionization from, 9: 3153
contamination, spectrographic determination of, after grinding with alumina ceramic, 9: 3471(J)
spectrographic analysis of, for minor elements, 9: 162
spectrophotometric analysis of, for K and Na, 9: 78
surface radioactivity detection by photographic plates, 9: 2707
theoretical effects of diffusion on isotopic abundance ratios in, and associated fluids, 9: 3464(J)
Round Mountain area (Nev.)
thorium distribution, 9: 1260(J)
Rubber
(See also Elastomers; Plastics; Silicone rubbers.)
corrosion resistance and applications of construction, survey and director of, 9: 137(J)
three-quantum annihilation of positrons in, 9: 249(J)
Rubidium
radiochemical determination, 9: 876, 2634
resistivity transition at ~180°K, investigation of, 9: 2341(J)
Rubidium antimonides
crystal structure, 9: 1893(R)
Rubidium borates
coloration, 9: 4314(J)
Rubidium bromides
fluorescence and thermoluminescence in x-irradiated crystals of, 9: 3682(J)
Rubidium chloride–aluminum chloride systems (liquid)
electric conductivity, 9: 2613
Rubidium isotopes
mass ratios of, determined from microwave spectra of alkali halides, 9: 811(J)
Rubidium isotopes Rb^{81}
spin, magnetic moment, and hyperfine structure, 9: 1354(J)
Rubidium isotopes Rb^{86}
enrichment by countercurrent electromigration, 9: 1313(J)

Rubidium isotopes Rb^{85} (cont'd)

nuclear electric quadrupole moments, 9: 4277(J)

Rubidium isotopes Rb^{86}

decay scheme, literature survey, 9: 2069(J)

formation and decay, 9: 2510(J)

half life, 9: 4280(J)

Rubidium isotopes Rb^{87}

nuclear electric quadrupole moments, 9: 4277(J)

Rubidium isotopes Rb^{88}

decay schemes, measurements and and interpretation, 9: 3332(J)

Rubidium oxides

theoretical analysis of $Rb_4(O_2)_3$, 9: 4067(J)

Rubies

thermal rupture of, effects of shape on, 9: 1503(J)

Ruby Quadrangle (Ariz.)

exploration, geology, and mineralogy, 9: 161

Ruthenium

determination of, in biological material, sample preparation, 9: 3777

determination of, as sulfide, 9: 82(J)

radiochemical determination, 9: 876

Ruthenium complexes

with tris-2,2'-bipyridine, preparation and chemical properties, 9: 512

Ruthenium isotopes Ru^{99}

neutrino reactions in stars, 9: 1914(J)

Ruthenium isotopes Ru^{103}

decay scheme, 9: 1408(J), 3342(J)

disintegration, 9: 2970(J)

fission yield of, from U^{235} and U^{238}, fine structure in, 9: 670(J)

Ruthenium isotopes Ru^{105}

fission yield of, from U^{235} and U^{238}, fine structure in, 9: 670(J)

Ruthenium isotopes Ru^{106}

beta decay, coincidence study of, γ rays from, 9: 2062(J)

from fission, lethal effects in mice, 9: 2547(R)

fission yield of, from U^{235} and U^{238}, fine structure in, 9: 670(J)

Ruthenium–platinum alloys

electric conductivity, 9: 976

Rutiles

(See also Titanium oxides.)

adsorption of methane, A, and Kr on, 9: 3113(J)

Rutin

chemical properties and physiological effects, 9: 3388(J)

Ryan Aeronautical Co.

progress reports on titanium formability and welding characteristics, 9: 1838(R), 1847(R), 3843(R)

S

S particles

(See also K particles; Mesons; V particles.)

decay of, probability for γ-ray emission in, 9: 1061(J)

decay processes, 9: 4205(R)

mass and stopping time, 9: 1066(R)

review of, in Annual Reviewed of Nuclear Science, 9: 3957(J)

Saclay Reactor

automatic control of, 9: 1082(J)

neutron spectrum, 9: 3641(J)

Salmon Bay Area (Alaska)

uranium distribution in, 9: 1523(J)

Salt bridges

design of, constructed of porous glass and ion-exchange membranes, 9: 3397(J)

Salt Wash Member

stratigraphic, sedimentary, and structural relationships of U deposits in, 9: 2262(R)

Salt Wash Member (Colo.)

exploration of, in Wray Mesa, 9: 1513

Salt Wash Member (Utah)

exploration of, in Wray Mesa, 9: 1513

geology of, 9: 160

Samarium

energy levels and L absorption spectra, 9: 2899(J)

preparation by reduction of Sm_2O_3 with Ca, 9: 2206(J)

tissue distribution of, in rats, tracer study, 9: 2551(R)

Samarium isotopes Sm^{153}

decay scheme, 9: 1683(J)

fission yield of, from natural U, 9: 1700(J)

Samarium nitrates

preparation of anhydrous, by reaction of oxides and NO_2, 9: 112(J)

solvent partition of, between nitric acid and tributyl phosphate, 9: 901

Samarium oxides

reduction of Sm_2O_3 with Ca to prepare massive Sm, 9: 2206(J)

Sampling

apparatus for, of radioactive liquids, design, 9: 1424(P)

automatic changer design, 9: 3965(R)

industrial, lectures on theory of, 9: 4238

liquid, automatic large-scale, 9: 569(J)

of liquid wastes, design of proportional sampler for, 9: 2656(J)

multi-level continuous plans for, mathematical analysis, 9: 3209

of radioactive chemicals, 9: 576(J)

remote liquid, air-lift systems for, 9: 568(J)

statistical analysis of economics of, 9: 79

San Rafael River District (Colo.)

stratigraphy, 9: 2262(R)

San Rafael District (Utah)

occurrence of rabbittites in Lucky Strike No. 2 Mine in, 9: 3829(J)

San Rafael Swell (Utah)

mineralogy, 9: 1829

Sandstone deposits (S. Dak.)

occurrence in White River Badlands, 9: 3158(J)

Sapphires

thermal conductivity, 9: 2793(R)

Scalers

design of, for measurement of half lives in range 3 sec to 30 min, 9: 2420(J)

voltage converter for automatic plotting, design, 9: 3242

Scandium

extraction from wolframite and thortveitite and purification by ion exchange, 9: 3430(J)

neutron total cross section from 0.0015 to 3000 ev, 9: 2905(J)

radiochemical determination, 9: 876

Scandium compounds

with cyclopentadiene, 9: 3096(J)

Scandium isotopes Sc^{40}

decay scheme, 9: 2997(J)

Scandium isotopes Sc^{44}

capture-positron branching ratios, 9: 1674(J)

Scandium isotopes Sc^{48}

decay scheme and mass determination, 9: 3343(J)

Scandium oxides

heat and free energy of formation, 9: 529(J)

Scattering

(Limited to theoretical studies of scattering processes of particles in general composite systems; see also appropriate subheadings under specific particles and radiations.)

and compound nucleus formation in nuclear reactions, model for, 9: 351(J)

cross section transformations, 9: 417(J)

elastic, integral term for, 9: 2031

elastic, of charged particles by nuclei, generalized formula, 9: 3667

elastic phase scattering of 1.9- to 3.8- Mev neutrons by C^{12}, 9: 1366(J)

of fast charged particles by shielded coulomb field, theory, 9: 3668(J)

of gamma rays by nucleons, theory, 9: 426(J)

limiting processes in formal theory of, 9: 1112(J)

linear extrapolation length of, at surface of imperfectly absorbing cylinders, 9: 3997(J)

many-body, solution by Fredholm's equation, 9: 1113(J)

meson-nucleon, S matrix expressed in Heisenberg representation for, 9: 3704(J)

Monte Carlo evaluation of single scattering integrals, 9: 2926

multiple, of fast charged particles, theory, 9: 3996(J)

multiple scattering measurements in nuclear emulsions, 9: 3325(J)

neutron-deuteron differential angular cross sections, 9: 3995

phase shift, lower limit for energy derivative of, 9: 4335(J)

photon-nucleon, calculation of cross section from experimental photomeson production cross section, 9: 405(J)

pion-nucleon, theoretical analysis, 9: 403(J)

possible triple-scattering experiments for studying, 9: 1660(J)

relation between zero-energy scattering phase shifts, Pauli exclusion principle, and number of composite bound states, 9: 2999(J)

tables of electron scattering solutions by a point charge, 9: 1139

theory of multiple, 9: 2029

theory of multiple Coulomb scattering from extended nuclei, 9: 775

variational principles applied to, 9: 463(J)

Schroeckingerites

crystal structure and physical and optical properties, 9: 958(J)

occurrence in Moab district (Utah) and Argentine (Mendoza Province), 9: 958(J)

Scintillation detectors

(See also Phosphors.)

application to x-ray diffraction, 9: 313(J)

bibliography, containing 500 references, 9: 1036

characteristics of, review, 9: 3942(J)

circuit design, 9: 3941(J)

design, for measuring atmospheric radioactivity, 9: 1045(J)

design of gaseous, 9: 988(R)

design of spherical, 9: 3965(R)

efficiency of, calculations on, 9: 1962

fluctuations in pulse energies, calculations on, 9: 1963

noise analyzers, 9: 1310(J)

optical shutter for use with, design, 9: 703(J)

performance of, for double tracer experiments, 9: 2539(R)

Scintillation detectors (cont'd)

performance of, in detection of α particles and neutrons, 9: 697

performance of, in determination of Zn^{65} in animal tissues, 9: 3379(J)

performance of, in scintillation counters for fast neutrons, 9: 1036

rise and decay times of, measurement, 9: 301

sensitivity, methods for improving, 9: 1046(J)

simplified, for assay of Rn gas, 9: 2874(J)

thallium-activated NaI crystals as, ionization energy loss of mesons in, 9: 708(J)

as tool in radiobiological research, review, 9: 1035

Scrubbers

(See also Extraction apparatus.)

design and performance of, for chemical fumes, mists and gases, 9: 932

design and performance of wet dust, 9: 3091(J)

performance characteristics of centrifugal, for aerosol collection, 9: 4125(J)

Sea water

corrosive effects, 9: 3459

corrosive effects of, on brass, bronze and cast Fe, 9: 3148(J)

isotopic content of O_2 and N_2 in, 9: 662(J)

Seals and glands

(See also Gaskets; Vacuum seals.)

ceramic-metal seal production by pressed powder techniques, 9: 4138(R)

electric losses in metal-ceramic seals, 9: 2786

high-temperature gas, for extensometer tensile tests, 9: 1498(J)

low-cost plastic sealer, 9: 565(J)

for reactor control rods, design and testing, 9: 3121

testing of frozen Na shaft seal, 9: 2689

Sedimentary deposits (Ariz.)

occurrence, 9: 2262(R)

Sedimentary deposits (N. Mex.)

occurrence, 9: 2262(R)

Sedimentary deposits (Utah)

occurrence, 9: 2262(R)

Seed

(See also specific plants.)

of barley, radiosensitivity, 9: 3369(J)

effects of pile radiation on barley, 9: 3030(J)

effects of radiation on, of barley, relation of CO_2, O and low temperature to, 9: 2593(J)

radiosensitivity of, effects of water content on, 9: 483(J)

Sego Lilly Lou Open Pit (Colo.)

uranium distribution, 9: 1513

Selenious acid

kinetics of H_2O_2 oxidation of, 9: 851

Selenium

proton stopping cross section, 9: 2026

Selenium fluorides

complex with pyridine, preparation, 9: 2220(J)

infrared spectra and molecular structure of SeF_6, 9: 3410

Selenium–iron systems

surface tension, 9: 2702(R)

Selenium isotopes Se^{75}

decay scheme revision from coincidence studies of γ rays, 9: 2062(J)

Selenium oxides

heat and free energy of formation, 9: 529(J)

Self-diffusion

coefficients, effect on time of anneal and method of counting radiation on reproducibility of results, 9: 197(J)

theory of, in solutes and solvents, 9: 3866

Semiconductors

(See also specific materials; see also Electric conductivity.)

abstracts of literature on, 9: 3225(J)

design of radioactive cells, using p-n junctions and, 9: 251(J)

diffusion of holes in, 9: 3676(J)

effects of radiation on voltage output, 9: 3208(R)

Separation processes

(See also appropriate subheadings under specific materials; see also separation processes by type, e.g., Ion exchange processes; Electromagnetic separation.)

interlocking plate for charging dissolver of reactor fuel slugs, 9: 587(J)

paper chromatography and paper electrophoresis, manual, 9: 3076(J)

procedure for separations in a drop, 9: 1786(J)

for reactor fuels, 9: 591(J)

for reactor fuels, techniques and estimated costs, 9: 3289(J)

remote-control equipment for, 9: 570(J), 571(J)

Septicemia

following total-body irradiation in mice, 9: 2553(J)

Servomechanisms

(See also Laboratory equipment; Reactor control rods; Remote-control equipment.)

amplifier design for, 9: 4229

bibliography on, 9: 2828, 2829

design of 100-amp d-c servostabilizer for β spectrometer, 9: 1584(J)

Sewage

(See also Waste disposal; Waste processing.)

use of radioisotopes in tracing flow of, 9: 613(J)

Seven Mile Canyon Area (Utah)

mineralogy, 9: 1829

Shales

(See also Black shales; Carbonaceous shales.)

analysis, mineralogy, and petrology of U-bearing, 9: 3461(R)

analysis and mineralogy of U-bearing, 9: 621(R)

Shell Development Co.

progress reports on grease lubrication phenomena in open, shielded, and sealed anti-friction bearings, 9: 2790(R), 2791(R)

Shells (geometry)

and shell-like structures, bibliography of articles and books, 9: 3439

Shelters

(See also Structures.)

reduction of γ doses from fall-out in, 9: 2590

Shield Testing Reactor

(See Bulk Shielding Facility.)

Shielded containers

for iridium (Ir^{192}) source, design, 9: 3901(J)

Shielding

(See also appropriate subheadings under devices shielded; see also main heading by name of radiation shielded, e.g. Gamma shielding.)

bibliography, 9: 2077

mathematical data, 9: 2983

mobile, for target removal from cyclotron, 9: 810(J)

stabilization by interlocking bricks, 9: 3345

Shinarump Formation

mineralogy, 9: 1829

Shock waves

(See also Impact shock.)

interaction with a constriction, mathematical analysis of pressure, densities, and temperatures encountered, 9: 1551

separation into elastic and plastic components, techniques for observing, in metals, 9: 3903(J)

Sierra Blanca Area (N. Mex.)

geophysical exploration, 9: 2709

Silanes

hydrolysis, oxidation, pyrolysis, and synthesis of alkoxy- and aryloxy-, 9: 854

hydrolysis and oxidation of tetra-2-pentoxysilane, 9: 3758(R)

methychloro-, use of vapors to remove adsorbed water in vacuum systems, 9: 944(J)

synthesis, 9: 4091(R)

tetrapentoxy-, oxidation of, 9: 3382(R)

triorgano-, hydrogen isotope effects in alkaline cleavage of, 9: 3057(J)

Silicane

rotational constants of D-labeled, 9: 3080(J)

Silicon

colorimetric determination of, in Ti alloys, 9: 2632

determination of, in U–Si systems, 9: 4074

lattice constants, 9: 3408

spectrographic determination of, in ores and rocks, 9: 162

Silicon–aluminum–copper systems

corrosion resistance and mechanical properties of, effects of variation of zinc content on, 9: 3541(J)

effects of vibration on solidification, 9: 3851

Silicon–aluminum–magnesium systems

electrolytic polishing, 9: 4189(J)

Silicon–aluminum systems

soft x-ray spectra, 9: 3697(J)

Silicon–aluminum systems (liquid)

solubility of solid Al and Al alloys in, 9: 1871(J)

Silicon–aluminum–titanium systems

effects of heat treatment on elevated-temperature tensile properties and microstructure, 9: 2719(R)

hardness, crystal structure, and phase studies, 9: 3520

melting techniques and forging temperatures for preparation of, 9: 1850(R)

oxidation, 9: 3849(R)

phase studies and hardness of, 9: 1843(R)

tensile properties of as-forged, 9: 2279(R)

transformation temperatures, age hardening, heat treatment, and mechanical properties, 9: 1534(R)

Silicon–aluminum–zinc systems

corrosion of, in 95°C, low-conductivity, aerated, distilled water, 9: 2725

Silicon bronze

corrosion by chlorinated and alkalized boiler water and pure deionized water, 9: 3168

Silicon carbide compacts

thermal rupture of, effects of shape on, 9: 1503(J)

Silicon carbides

thermal conductivity, 9: 946(R)

Silicon–carbon–titanium systems

constitution diagrams, 9: 4187

Silicon–chromium systems

preparation, corrosion, physical properties, and testing, 9: 2740

Silicon–cobalt–molybdenum systems

oxidation at 945 ± 10°C, 9: 3146

Silicon–copper systems

galling and seizing of, by friction coefficients, 9: 1269

Silicon isotopes Si^{27}

beta emission, 9: 1121

Silicon isotopes Si^{29}

deuteron reactions (d,γ), energy and intensity of γ rays from, 9: 379(J)

deuteron reactions (d,p), 9: 2008(J)

energy levels, 9: 739(J)

gamma reactions (γ,n) and (γ,p), cross sections, 9: 3301(J)

gamma reactions (γ,p) and (γ,n), yield ratios, 9: 3300(J)

Silicon isotopes Si^{29}

energy levels, 9: 2008(J)

energy levels from decay of P^{29}, 9: 2057(J)

nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)

Silicon–manganese systems

soft x-ray spectra, 9: 3697(J)

Silicon–nickel systems

phase studies, 9: 3184(J)

Silicon oxide–aluminum oxide–calcium oxide systems

electrolysis of slags of, containing S, 9: 2135(R)

Silicon oxide–boron oxide–lithium oxide systems

thermal expansion, 9: 1555

Silicon oxide–nickel systems

heats of adsorption of N on, 9: 1789

Silicon oxide–sodium oxide–zirconium oxide systems

physical and chemical properties and crystallography of phases in, 9: 2138(J)

Silicon oxides

charge equilibrium ratios for H ions from proton bombarded, 9: 2486(J)

effects of pile irradiation on, 9: 4011(J)

heat and free energy of formation, 9: 529(J)

moderation of fast neutrons in, 9: 3999(J)

vitreous, neutron damage to structure of, 9: 2497(J)

Silicon oxides (colloidal)

adsorption of boron hydrides by, 9: 53

gas chromatographic elution of gases and volatile liquids from by H_2, N_2, or CO_2, 9: 2672(J)

Silicon oxides (fused)

coloration of, induced by γ and reactor irradiation, 9: 4102(J)

coloration of, induced by x irradiation and heat treatment, 9: 4103(J)

radiation-induced color centers in, 9: 4315(J)

thermal conductivity, 9: 2793(R)

Silicon–uranium systems

determination of Si in, 9: 4074

Silicone rubbers

adhesion of, to glass fabrics, 9: 4114(R)

Silicones

lubricity for high-temperature ball bearings, 9: 1813

thermal conductivity of viscous, 9: 2336(J)

Silver

absorption of cosmic μ mesons, 9: 721

adsorption of aliphatic compounds on, from aqueous solutions as inferred from H_2 overvoltage measurements, 9: 595(J)

adsorption of hexanethiol by contact angle measurements on, 9: 3111(R)

anisotropy of grain-boundary self-diffusion in bicrystals of, 9: 1864(R)

anisotropy of grain-boundary self-diffusion in bicrystals of, 9: 3867(R)

charge equilibrium ratios for H ions from proton bombarded, 9: 2486(J)

Silver (cont'd)

coulomb excitation, 9: 1066(R)

cross sections for neutron transmission and multiplication, 9: 3646(J)

diffusion in AgBr, 9: 1189(J)

effects of 12-Mev deuterons on, near 10°K, 9: 2946(J)

elastic scattering of 22-Mev α particles from, 9: 2937(J)

electric properties of, for nuclear batteries, 9: 266

electroforming from cyanide baths, 9: 3495

emission of secondary electrons, (δ rays) by 1.3-Mev electron bombardment, 9: 1306(J)

fast neutron scattering by, 9: 3309(J)

galling and seizing of, by friction coefficients, 9: 1269

gamma reactions (γ,n), 9: 1358(J)

grain-boundary diffusion in Cu bicrystals, anisotropy of, 9: 1285(J)

grain boundary self-diffusion and anisotropy, 9: 188(R)

heat of solution, in liquid Sn, 9: 4178

ion exchange on Dowex 50 at 25°C, 9: 3795(R)

lattice constants, 9: 3408

μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)

neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)

neutron resonances, 9: 1073(J)

number of vacancies and energy of vacancy formation in, 9: 3525(J)

proton reactions (p,n), angular distributions and yields at 23 Mev, 9: 4290(J)

proton stopping cross section, 9: 2026

radiochemical determination, 9: 876

self-diffusion coefficient, effect of time of anneal and method of counting radiation on reproducibility of results, 9: 197(J)

self-diffusion coefficient in Ag–Pb, Ag–Cu, Ag–Ge, and Ag–Al alloys, 9: 3866

self-diffusion of, in Ag–Tl alloys, 9: 3867(R)

slow neutron cross sections, 9: 1391(J)

solubility of, in molten AgCl, 9: 3052

specific heat of, 9: 237(J)

spectrographic determination in Bi, 9: 1475

spectrographic determination of, in ores and rocks, 9: 162

thermal ionization of, ion spectrum, 9: 61(R)

Silver alloys

galling and seizing of, by friction coefficients, 9: 1269

Silver–aluminum alloys

age-hardening of, in thin layers, 9: 2782(J)

intercrystalline grains in, growth of, determined by the method of microhardness, 9: 642(J)

thermodynamic properties and phase studies, 9: 2294(R)

thermodynamic properties and x-ray measurement of various phases, 9: 972(R)

Silver bromides

diffusion of Ag and Pb in, 9: 1189(J)

Silver–cadmium alloys

heat of formation, 9: 4178

heat of solution, in liquid Sn, 9: 4178

vapor pressures over solid α, equipment for measuring, 9: 3177(R)

Silver chlorides

electron mobility in, temperature dependence, 9: 2352(J)

reduction by hydrogen, reaction mechanisms, 9: 3763

reduction by hydrogen or deuterium, reaction mechanisms, 9: 3764

reduction of, by H and deuterium, 9: 3765

Silver chlorides (liquid)

solubility of Ag in, 9: 3052

Silver crystals

diffusion of Cd, In, and Sn in, tracer study, 9: 668(J)

Silver electrodes

potential of Ag, AgCl and Hg, HgCl combination in HCl, 9: 2623(J)

Silver–gold alloys

stored energy in, by drilling, filing, torsion, wire-drawing, and rolling at room temperature and 78°K, 9: 3177(R)

Silver–gold alloys (liquid)

Gibbs free energy and enthalpy of solution, 9: 3867(R)

thermodynamic properties, 9: 188(R)

Silver–gold couples

surface diffusion coefficients of, methods for determination, 9: 3848(R)

Silver iodides

adsorption of Ag^+ and I^- on, in absence and presence of lauric acid, 9: 3111(R)

adsorptive properties of, for Ag^+ and I^- in presence and absence of lauric acid, 9: 623(R)

surface area measurement of, by the Kr method, 9: 623(R)

Silver iodomercurates

order-disorder phenomenon, electrical conductivity measurements to study, 9: 3890(R)

Silver ions

adsorption of, on AgI in absence and presence of lauric acid, 9: 3111(R)

adsorption of, on AgI in presence and absence of lauric acid, 9: 623(R)

adsorption of, on sphalerite, 9: 3111(R)

Silver isotopes

electrolytic separation of, negative results, 9: 289

Silver isotopes Ag^{104}

gamma spectra from deuteron bombardment, 9: 734

Silver isotopes Ag^{108}

gamma reactions (γ,α), 9: 3674(J)

Silver isotopes Ag^{110}

beta spectra, 9: 3969(J)

Silver isotopes Ag^{112}

gamma spectrum, 9: 4018(J)

Silver Lady Claims (Calif.)

uranium distribution, 9: 3154

Silver–lithium alloys

constitution diagrams, casting, and crystal structure, 9: 2767(J)

Silver–lithium–magnesium alloys

constitution diagram of, 9: 2768(J)

Silver nitrate–sodium nitrate–water systems

activity coefficients at 25°C, 9: 3795(R)

Silver nitrates

adsorption of, on gold surfaces, 9: 3766

adsorption on powdered silver, 9: 3432(J)

viscosity and electrical conductivity relationship in solutions of, 9: 1748(J)

Silver oxides

band spectra of AgO, 9: 3798(J)

heat and free energy of formation, 9: 529(J)

Silver Peak Mountain Area (Nev.)

geology, mineralogy and U distribution, 9: 1524

Silver Pick Property (Nev.)

exploration, 9: 1260(J)

exploration, geology, mineralogy, and U distribution, 9: 1516

Silver powders

adsorption of $AgNO_3$ and KCl on, 9: 3432(J)

effects of particle size on grain growth of sintered, 9: 2318(J)

Silver Reef District (Utah)

mineralogy, 9: 1829

Silver sulfates

adsorption of, on gold surfaces, 9: 3766

Silver sulfides

adsorption isotherms and capacity curves, 9: 3111(R)

electric conductivity, 9: 1467

Silver–thallium alloys

diffusion of Ag and Tl in, 9: 188(R)

Silver–zinc alloys

diffusion of Zn in, with admixtures of Au, Ga, Sn, Sb, Al, and In, 9: 3875

relaxation strength, 9: 1537

Simon-Ray Claim (Calif.)

geology, 9: 3837(J)

Singer Mine (Nev.)

uranium distribution, 9: 1260(J)

Single crystals

cleaning, sorting, and mounting of microscopic, for electrical measurements, 9: 1302

preparation of Ti–11% Mo, for study of α-β transformation, 9: 1844(R)

Sintering

resistance, under pressure, equipment and methods for, 9: 1878(J)

of stainless steel compacts in H_2 and dissociated ammonia, 9: 2754(J)

Skeleton

(See also Bones.)

sampling of, by excision of sections of tailbone, in cattle, 9: 1156(R)

Skin

burns of, protective effects of fabrics against, 9: 481

burns of, protection afforded by fabrics, in pigs, 9: 1157

diffuse reflectance, 9: 2521(J)

diffusion of fluids in, effects of irradiation on, in rabbits, 9: 3742(J)

effects of β particles on, 9: 836(J)

effects of β radiation on, of burros, horses, cattle, and sheep, 9: 1156(R)

effects of radioactive and chemical carcinogens on, in mice, 9: 2565(J)

erythema reaction of, following exposure to x radiation and cathode rays, 9: 1158(J)

inflammatory response in, effect of β irradiation on, 9: 830(J)

pig, effects of thermal radiation on, shielding afforded by a textile, 9: 4050

radiation cancer of, review of 21 case histories, 9: 32(J)

radioinduced erythema, inhibition with amino acids, 9: 2602(J)

response to thermal radiation, effects of color on, in swine, 9: 4045

trauma of, formation of new capillaries following, effects of x irradiation on, in mice, 9: 2561(J)

tumors of, effects of inhalation of oxygen on x radiation therapy, 9: 2124(J)

Skin grafting

effects of high-dosage x irradiation and injected homologous bone marrow on, in mice, 9: 2560(J)

Slags

electrolysis of Al_2O_3–CaO–SiO_2, containing S, 9: 2135(R)

molten silicate, electrolysis in, 9: 1467

Slana Area (Alaska)

exploration, 9: 628(J)

Slurries

heat transfer, thermal conductivity, viscosity, density, and turbulent flow of, 9: 2236(J)

Small Spot Claim (Colo.)

mineralogy, 9: 1829

Smokes

diffusion in atmosphere, measurement, 9: 2539(R)

from Raleigh reactor stack, dispersal, meteorological factors, 9: 3978

Sodium

alignment of atoms in, by scattering of unpolarized light, 9: 245(J)

chromatographic determination of, in mixtures of Na, K, Mg, and Ca, 9: 3400(J)

cleaning of residual, from circulation loops with liquid ammonia, 9: 4179(R)

continuous ion exchange with an endless belt of phosphorylated cotton, 9: 3104(J)

dietary, influence on hypertension in humans, 9: 472(J)

exchange with K across erythrocyte surface, tracer study, 9: 2099(R)

ion exchange on Dowex 50 at 25°C, 9: 3795(R)

ion exchange separation from Ca and Mg and titrimetric determination of, 9: 1200(J)

mixing of injected, effects of age and sex on, in humans, tracer study, 9: 3730(R)

neutron-activation determination of, in Al alloys, 9: 1204(J)

radiochemical determination, 9: 876

reaction with $BF_3 \cdot NH_3$, 9: 515

self-diffusion coefficients in, near the melting point, 9: 2799(J)

spectrophotometric determination of, in siliceous, argillaceous, and phosphate rocks, 9: 78

surface energy of, theoretical determination of, 9: 672(J)

transport of, in human erythrocytes, tracer study, 9: 1736(J)

Sodium (liquid)

centrifugal pump for, design of, 9: 943(J)

circulation systems, design and testing, 9: 4175(R)

circulation systems, instrumentation, 9: 4179(R)

corrosion of Armco Fe and 347 stainless steel in 1000°F, effect of O_2 on, 9: 948

corrosion of Zr and stainless steel and analysis of, 9: 1254

corrosion testing, 9: 1897(R), 1899(R), 9(R)

corrosive effects on Globeiron, 9: 1901(R), 1902(R), 1903(R)

corrosive effects on Ti, 9: 1904(R)

density of, from 254° to 860°C, 9: 3386

flow decay in heat transfer system for, 9: 1806

handling of, design, fabrication, operation, and testing of apparatus for, 9: 3443

heat transfer and corrosive effects, 9: 4175(R)

heat transfer coefficient of Zr tubing in, 9: 1254

heat-transfer experiments with, design and performance of apparatus for, 9: 3443

heat-transfer properties and electrical resistance, 9: 4179(R)

leak detection, equipment for, 9: 4179(R)

leak detection of, in vertical piping, 9: 605

mass transfer by, in Ni or stainless steel loops, 9: 4179(R)

mass transfer in irradiated stainless steel loops circulating, 9: 4179(R)

mass transfer in stainless steel loops, inhibition, 9: 4175(R)

mass transfer of stainless steel components in 925°F, effects of O_2 on, 9: 3827

surface tension, measurement, 9: 2340(J)

surface tension of, using vertical Cu, Mo, and Zn plate technique, 9: 229(J)

Sodium (liquid) (cont'd)

viscosity, 9: 1277(J)

wetting of Zn, Cu, and Mo by, 9: 229(J)

Sodium acetates

metabolism of, in pantothenic acid-deficient rats, 9: 61(R)

Sodium acid carbonates

resorption rate of, effects of x radiation and hormones on, in rats, tracer study, 9: 3732(J)

Sodium–bismuth alloys

microhardness and surface tension, 9: 3527(J)

Sodium borates

chemical reactions, 9: 2613

coloration, 9: 4314(J)

Sodium borohydride–formamide, *N,N*-dimethyl systems

electrolysis, 9: 2615

Sodium borohydrides

chemical reactions and solvent properties, 9: 2615

toxicity, 9: 4054

Sodium bromide–aluminum chloride systems (liquid)

electric conductivity, 9: 2613

Sodium bromide–sodium systems

equilibrium compositions in, 9: 2154(J)

Sodium bromides

emission, excitation, and absorption spectra of Ag-activated, 9: 3116(J)

Sodium carbonates

absorption of carbon dioxide by, kinetics, 9: 1791(J)

concentration of O^{18} in water of crystallization, 9: 2267(J)

Sodium chlorates

effects of pile irradiation on, 9: 3424(J)

Sodium chloride–aluminum chloride systems (liquid)

chemical reaction, constitution diagrams, self-diffusion, and electric conductivity, 9: 2613

Sodium chloride crystals

color centers in x-irradiated, production and bleaching of, 9: 801(J)

effects of radiation on electric conductivity, 9: 800(R)

fluorescence and thermoluminescence in x-irradiated, 9: 3683(J)

thermoluminescence in irradiated, 9: 4317(J)

Sodium chloride–potassium chloride systems (liquid)

explosions with water, prevention of, 9: 1743

Sodium chloride–sodium chromate systems

corrosive effects of Mg and Mg alloys, 9: 3870

Sodium chloride–sodium fluoride systems (liquid)

corrosive effects on Ti, 9: 1255(J)

Sodium chloride–sodium systems

equilibrium compositions in, 9: 2154(J)

Sodium chloride–water systems

corrosion effects, 9: 3459

Sodium chlorides

coloration and luminescence of, radiation-induced, 9: 4314(J)

emission, excitation, and absorption spectra of Ag-activated, 9: 3116(J)

energy loss of 23-kev electrons, 9: 1665(J)

specific heat of, 9: 237(J)

vapor pressure lowering of water by addition of, 9: 524(J)

Sodium chlorides (liquid)

corrosion and polarization studies of Cu, Cu alloys, Ni, Ni alloys, titanium and brass in 3%, 9: 2259(J)

Sodium chromate–sodium chloride systems

corrosive effects of Mg and Mg alloys, 9: 3870

Sodium chromates

corrosion-inhibition properties of mixture of chloramine and, 9: 153

Sodium fires

prevention, 9: 4179(R)

Sodium fluoborate–hydrofluoric acid systems

phase studies, 9: 2614

Sodium fluoride–hydrofluoric acid systems

phase studies, 9: 2614

Sodium fluoride–lithium fluoride–potassium fluoride systems

thermal capacity and enthalpy, 9: 634(R)

Sodium fluoride–sodium chloride systems (liquid)

corrosive effects on Ti, 9: 1255(J)

Sodium fluoride–sodium systems

equilibrium compositions in, 9: 2154(J)

Sodium fluoride–uranium systems

preparation, 9: 927(J)

Sodium fluorides

absorption of F_2 by, 9: 3082

sintering of, 9: 653(R), 2702(R)

Sodium formates

potentiometric titration of, in formic acid with an H electrode, 9: 523(J)

Sodium graphite reactors

design, 9: 755(J), 3293(J)

Sodium hydrides

heats of formation and hydrolysis, 9: 2333

toxicity, 9: 4054

Sodium–hydrogen systems

dissociation pressures of H in Na–NaH–H systems at 500° to 600°C, 9: 3774(J)

Sodium hydroxides

infrared spectra at room and liquid-air temperatures, Raman spectra at room temperature, and crystal structure, 9: 3434

infrared spectra of D-labeled, at room and liquid-air temperatures, 9: 3434

Sodium hydroxides (liquid)

corrosive effects on metals and alloys at 1000 and 1500°F, 9: 1508

corrosive effects on Ni containers, 9: 951(J)

density of, from 447° to 736°C, 9: 3386

reactions with Be, Cr, Cu, Fe, Mn, Monel, Ti, and Ta, 9: 1466(R)

Sodium iodide crystals

detection of photoneutrons with, 9: 3944(J)

escape peak corrections for iodine K x radiation from, 9: 312(J)

fluorescence and thermoluminescence in x-irradiated, 9: 3682(J)

preparation and properties, 9: 1597

response of thallium-activated, to fission fragments, 9: 1606(J)

thallium activated, cosmic-ray bursts in, near sea level, 9: 676(J)

thallium activated, fluorescent response of, to nuclear radiations, 9: 1043(J)

thallium activated, ionization energy loss of mesons in, 9: 708(J)

Sodium iodide–sodium systems

equilibrium compositions in, 9: 2154(J)

Sodium iodides

thallium activated, scintillation response of, at low particle energies, 9: 707(J)

Sodium ions

activity measurements with resin membrane electrodes, 9: 2149(J)

adsorption of, on quartz, effect of pH, 9: 623(R)

Sodium ions (cont'd)

adsorption on quartz, 9: 3111(R)

conductometric determination of, in paper chromatograms, design and performance of apparatus for, 9: 2215(J)

transfer through mucosa of normal and artificially constructed bladders, tracer study, 9: 1732(J)

Sodium isotopes Na^{22}

capture-positron branching ratios, 9: 1674(J)

electron capture at very low energy, 9: 2961(J)

energy levels and excitation energies, 9: 4205(R)

nuclear magnetic moment of, calculated by proton-neutron coupling, 9: 742(J)

K capture to positron ratio of, 9: 1672(J)

spectra, 9: 1133

Sodium isotopes Na^{23}

activation determination, biological applications of, 9: 1650(J)

Coulomb excitation functions and energy levels for, bombarded with 3.5-Mev α particles, 9: 423(J)

deuteron reactions (d,d), 9: 1066(R)

gamma reactions ($\gamma,\alpha 2p$), N^{17} yield curve from, 9: 3644

neutron reactions (n,2n), cross section for, 9: 4281(J)

neutron total cross sections, 9: 988(R)

nuclear electric quadrupole moment, 9: 2903(J)

proton reactions (p,α), α angular distributions from, 9: 1646(J)

proton reactions (p,γ), 9: 2454(J)

proton reactions (p,γ), γ rays from, 9: 764(J)

thermonuclear reactions of protons with, in stars, 9: 3647(J)

Sodium isotopes Na^{24}

determination of, in body fluids, simultaneously with determination of K^{42}, 9: 1465(J)

gamma radiation from, counting in the presence of K^{42}, 9: 2429(J)

half life, 9: 2960(J)

quantitative determination of γ radiation from internally deposited, in humans, 9: 3591(J)

radium equivalent of γ source of, 9: 3657(J)

Sodium–lithium alloys (liquid)

activity coefficients and phase studies, 9: 172

Sodium nitrate–silver nitrate–water systems

activity coefficients at 25°C, 9: 3795(R)

Sodium nitrates

absorption spectrum of, exposed to ionizing radiation, 9: 2665(J)

effect on the vapor tension and calorimetry of 100% and aqueous solution of nitric acid, 9: 2140(J)

perpendicular bending frequency in, N^{15} isotope shift, 9: 919(J)

Sodium oxide–silicon oxide–zirconium oxide systems

physical and chemical properties and crystallography of phases in, 9: 2138(J)

Sodium oxide–uranium (VI) oxide–water systems

equilibrium phase relations in, 9: 58

Sodium oxides

solubility in liquid Na, effects of K on, 9: 4175(R)

Sodium phosphates

chain branching in, dependence on Na/P ratio and rate of degradation at 25°, 9: 3772(J)

Sodium–potassium alloys (liquid)

circulation systems, instrumentation, 9: 4179(R)

corrosion of Zr and stainless steel and analysis of, 9: 1254

corrosive effects on electrical insulating materials, 9: 4179(R)

equilibrium solubility of Fe in, equipment and procedures for studying, 9: 3501

friction factor, effects of Reynolds Number on, 9: 4179(R)

Sodium–potassium alloys (liquid) (cont'd)
heat-transfer properties and electrical resistance, 9: 4179(R)
sampling, 9: 4179(R)
viscosity, 9: 1277(J)
wear of stainless steel bearings in, 9: 2280
wetting of surfaces with, heat transfer in, 9: 4175(R)
Sodium–potassium compounds (intermetallic)
thermodynamic properties, 9: 2735(R)
Sodium salts
deposition in steam-generating pipes, 9: 3449(J)
Sodium silicate glass
thermal conductivity, 9: 946(R)
Sodium–sodium bromide systems
equilibrium compositions in, 9: 2154(J)
Sodium–sodium chloride systems
equilibrium compositions in, 9: 2154(J)
Sodium–sodium fluoride systems
equilibrium compositions in, 9: 2154(J)
Sodium–sodium iodide systems
equilibrium compositions in, 9: 2154(J)
Sodium sulfates
concentration of O^{18} in water of crystallization, 9: 2267(J)
Sodium uranates
formation, 9: 3438(J)
Sodium vanadates
absorption spectra of, application to determination of V, 9: 86(J)
Soils
capillary conduction of ground water in, 9: 236(J)
fission-product contaminated, analysis, 9: 534
Solid solutions
enthalpy change and strain energy in formation of, 9: 187
relaxation effects in, arising from changes in local order, 9: 204(J)
relaxation strength of, theory, 9: 1537(J)
Solid State and Molecular Theory Group, Mass. Inst. of Tech.
progress reports, 9: 231(R)
Solids
disordering of, by neutrons, theory, 9: 4014(J)
effects of agitation on gas fluidization of, 9: 2235(J)
fracture of, 9: 644(J)
heat transfer film coefficient for water suspensions in turbulent flow containing, of high thermal conductivity, 9: 2236(J)
physics of, 9: 2338(J)
x-ray-diffraction analysis of surface properties, 9: 186
Solubility
equipment and procedures for studying, of metals, 9: 3501
methods of measurement, 9: 3068
Solutions
critical point measuring equipment and techniques, 9: 513
effects of α radiation on aqueous, 9: 580(J)
fluorescent behavior of organic, upon irradiation, 9: 4316(J)
Solvent extraction processes
mass transfer in horizontal liquid-liquid extraction tube, 9: 2208
for reactor fuels, techniques and estimated costs, 9: 3289(J)
review, 9: 3105(J)
Solvents
fluorescent behavior of organic, upon irradiation, 9: 4316(J)
mixed, determination of thermodynamic equilibrium constants in, 9: 869(J)
swelling of resins in mixtures of water and methanol, ethanol, isopropyl alcohol, and dioxane, 9: 1750(J)
Sonic inspection
(See also Ultrasonics.)
of adhesive bonded sheet metal, techniques and equipment, 9: 1263(R)
equipment for, of Zr and Zr alloys, 9: 4167
Sound
analysis of binary gas mixtures by a sonic method, 9: 4085(J)
scattering of, from randomly uneven surface, 9: 1284(J)
solution of linearized equations for dispersion of, in thermal relaxation of gases, 9: 3240(J)
South Carolina
map of geophysical exploration of Edisto Island Area in Berkeley, Charleston, Colleton, and Dorchester Counties, 9: 1833(J)
South Dakota (Custer Co.)
geology, mineralogy, and petrology of High Climb Pegmatite in, 9: 3636(J)
South Dakota (Harding Co.)
stratigraphy of U-bearing lignites in Mendenhall stripping site in, 9: 622(R)
South Dakota (Lawrence Co.)
exploration of Bald Mountain Mining District in, 9: 165(J)
South Dakota (Pennington Co.)
exploration of White River Badlands in, 9: 3150(J)
Southern Research Inst.
progress reports on development of a particle counter, 9: 3775(R)
progress reports on particle-size distribution of aerosols, 9: 2357(R)
Southwest Research Inst.
progress reports on polynuclear aromatic compounds for high temperature lubricants, 9: 517(R), 4108(R)
Spallation
(See also appropriate subheadings under specific isotopes and materials.)
empirical cross-section formulas for medium-weight elements, 9: 3982(J)
Specific heat
of solid bodies, theory, 9: 237(J)
Spectrographic analysis
(See also Mass spectrography; Spectrometers.)
background correction in, mechanical calculator for, 9: 4087(J)
five-track spectrograph, design, 9: 284(J)
of heavy elements, in UO_2, 9: 4074
Spectrometers
(See also specific spectrometers, e.g., Beta spectrometers; Microwave spectrometers.)
automatic direct reading, for analysis of metals, electronics in, 9: 3948(J)
Cine, five-track spectrograph, design, 9: 284(J)
design and performance of nuclear magnetic resonance, for quantitative analysis by nuclear magnetic adsorption, 9: 2678(J)
design of recording high-sensitivity paramagnetic resonance, 9: 2391(J)
luminosity of prism, grating, and Fabry-Perot, 9: 283(J)
rapid-scanning, for direct reading spectrographic analysis, 9: 2082(J)
resolution of magnetic-particle, 9: 449
resolution of spiral-orbit, 9: 3966(R)
scintillation, for study of low-energy bremsstrahlung spectra, design, 9: 3260(J)
scintillation pair, development, 9: 2099(R)
Spectrophotometers
photometric titration assembly for, 9: 4081(J)
sensitive in the wave-length region of 0.3 to 2.6 μ, design, 9: 916

Spectrophotometric analysis

of soluble solid mixtures and substances on chromatograms by differential measurements of reflectance, 9: 3395(J)

Spectroscopy

magnetic and electric deflection, for observation of recoils in neutrino emission from A^{37}, 9: 2078(J)

Stark effect broadening of higher Balmer lines of H, 9: 450(J)

Sphalerites

adsorptive and desorptive properties of, 9: 3111(R)

adsorptive properties of, on sphalerite, effect of ammonia concentration, 9: 623(R)

oxidation of, kinetics, 9: 3381

Spheres

thermal shock analysis, 9: 1497(J)

Spleen

biochemical activity, effects of whole-body x irradiation in rats, 9: 3738(J)

desoxyribonuclease activity of, effects of total-body x irradiation on in rats, 9: 468(J)

effects of homogenates of, on radiation injuries in mice, 9: 3370

effects of x radiation on, in mice, 9: 1723(R)

enzyme systems, effects of total-body x irradiation on, in rats, 9: 2120(J)

extracts of, radiosensitivity effects, 9: 3033

homogenates, protective effects against radiation injuries in mice, 9: 2596(J), 2600(J)

homogenates of, effects of injected, on adenosine triphosphatase activity, spleen weight, and leukocyte count in irradiated mice, 9: 38

homogenates of, protective effects against radiation injuries in mice, effects of storage, 9: 2594(J)

protective effects against radiation injuries, 9: 2547(R)

radiation-recovery factor from, of mice, 9: 3748(R)

radiosensitivity of, in mice, 9: 2547(R)

therapeutic effects on radiation injuries, 9: 837(J)

Spontaneous fission

fission yields in, of Cf^{252}, 9: 3633(J)

half lives, correlation with α-decay half lives, 9: 362(J)

Sprays

bibliography on, 9: 1738

Sputtering

high-vacuum, radiation damage theory, 9: 3898(J)

mechanism of, electron microscope study, 9: 2743(J)

Stack disposal

(See also Meterology; Radiation; Smokes.)

chimneys to control down-wash of gases, design, 9: 2688(J)

design of experimental stack for use in studies on, 9: 4263(J)

dosage calculations for radioactive clouds formed by sudden fission product release in, 9: 2700

filtration of radioactive aerosols from, by glass fibers, 9: 1491(J)

of gases from Raleigh reactor, meteorological factors, 9: 3978

Stainless steel

brazing of, with B–Ni–Cr systems, 9: 1886(J)

cladding of, by Ti with Cr, Co, Fe, Mo, and Ni, as bonding agents, 9: 4182

colorimetric analysis of, for Co by the tetraphenylarsonium method, 9: 2162

corrosion and thermal fatigue, 9: 1541(J)

corrosion by chlorinated and alkalized boiler water and pure deionized water, 9: 3168

corrosion by liquid U–Bi alloy, 9: 3285

corrosion in high temperature waters, 9: 3450

Stainless steel (cont'd)

corrosion of AISI 347 and 321, by alternate exposure to liquid and gaseous fluorine, 9: 4142

corrosion of, and stainless steel–Zn and Al–stainless steel couples by H_2O, inhibition with Na dichromate-chloramine mixtures, 9: 153

corrosion of, by wet and dry Cl_2 between 260 and 300°, 9: 158(J)

corrosion in HNO_3–$K_2Cr_2O_7$ solution, 9: 1885(J)

corrosion in 1000°F liquid Na, effect O_2 on, 9: 948

corrosion in water and aqueous media at 600 and 680°F, 9: 1822

corrosion testing, methods for cleaning exposed specimens for, 9: 953(J)

coupled to Ti, galvanic corrosion in H_2SO_4 solutions, 9: 3151(J)

creep and fatigue of, effects of grain size on, 9: 4184

cutting with air-carbon arc process, exploratory results on, 9: 213(J)

descaling methods for, corroded by high-temperature water, 9: 154

determination of relation of ferrite content to magnetic properties, 9: 3877(J)

ductility, hardness, and rupture of, effect of B, Ti, W, and Zr additions on, 9: 3502(R)

effects of ceramic coatings on stress-rupture and fatigue characteristics, 9: 4137(R)

effects of prestressing on fatigue strength of spot-welded, 9: 2315(J)

effect of structure, composition, and cold working on tensile properties of, 9: 2727(R)

fatigue strength of, 9: 214(J)

fatigue tests of seam-welded, 9: 3500

ferromagnetic saturation induction of small specimens of apparatus for measurement, 9: 3877(J)

galling, 9: 3843(R)

intercrystalline corrosion, due to aging, 9: 4143(J)

intergranular oxidation, measurement, 9: 4185

machining and grinding, 9: 4174

mass transfer and corrosion by liquid NaK and Na and microstructure, 9: 1254

mass transfer by liquid Na at 400 to 1000°F, 9: 4179(R)

mass transfer by liquid Na in loops of, inhibition, 9: 4175(R)

mass transfer in irradiated loops circulating liquid Na, measurement, 9: 4179(R)

mass transfer of components in liquid Na at 925°F, effects of O_2 on, 9: 3827

metallurgical aspects of welding precipitation-hardening, 9: 2314(J)

performance of equipment made of, effect of design, fabrication and installation on, 9: 1541

polarization, corrosion, and erosion-corrosion in fuming nitric acid from room temperature to 160°F, design and performance of equipment for testing, 9: 2255(J)

polishing of, with alumina abrasives, technique, 9: 3879(J)

remotely controlled heliarc welding device for joining tubes of, design, 9: 631

shrink fitting, effect of fabricating techniques on, 9: 3196(J)

specific heat and enthalpy of types 347 and 446, 9: 2308(J)

stress-corrosion, 9: 3540(J)

stress corrosion of auxiliary boilers of, 9: 3145

stress values of 304, 316, and 347, chart and nomograph for, 9: 3441(J)

wear in NaK, heptane, and hexadecane, 9: 2280

welded joints of, with copper–nickel alloys, thermal rupture, 9: 1264

welding, effects of alloying elements on, 9: 1888(J)

welding, equipment for, 9: 3514, 3515

welding, qualification tests on modified type 347 stainless steel electrodes for, 9: 2734

welding and heat treatment of pipes of, 9: 1279(J)

welding of, and mechanical properties of welded, 9: 1860

Stainless steel (cont'd)

welding of, effect on ferrite content, 9: 3864

welding of, for 1100°F turbine operation, 9: 3526(J)

welding of, in atmosphere of N, NO_2 formation during, 9: 629

welding of tubes to sheet, 9: 632

Stainless steel (austenitic)

ductility of AISI 303 and 310, effects of strain rate and temperature on, 9: 181

effects of neutrons on stability of type 347, magnetic techniques for investigating, 9: 3877(J)

high-manganese, properties, 9: 3543(J)

hot ductility of 316 and 347, device for testing and results, 9: 4197(J)

intergranular corrosion, effect of minor constituents on, 9: 1509

magnetic properties and microhardness of tensile-stressed, 9: 181

properties of, at elevated temperatures, 9: 3882(J)

welding to AMS 6415 low-alloy steel, 9: 1840

Stainless steel (ferritic)

properties of, at elevated temperatures, 9: 3882(J)

Stainless steel–aluminum couples

polarization, corrosion, and erosion-corrosion of galvanic, in fuming nitric acid from room temperature to 160°F, design and performance of equipment for testing, 9: 2255(J)

Stainless steel compacts

corrosion of, effect of sintering atmosphere on, 9: 2754(J)

sintering of, in H and dissociated NH_3, 9: 2754(J)

Stainless steel–titanium couples

electrochemical corrosion, 9: 1838(R)

Stalin's Present Mine (Nev.)

uranium distribution, 9: 1260(J)

Standard Oil Co. of Ind.

progress reports on development and evaluation of high-temperature greases, 9: 1814(R)

Standards

use of plastic in preparing, 9: 2387(J)

Stanford Research Inst.

progress reports on determination of the mechanism of increase of viscosity of organosilicon compounds at high temperatures, 9: 3382(R), 3758(R)

progress reports on thermodynamic properties of molten salts, 9: 2792(R)

Stark effect

broadening of higher Balmer lines of H, 9: 450(J)

perturbation of atomic energy levels by nonuniform Coulomb fields, 9: 2079(J)

Stars

thermonuclear reactions involving protons on light nuclei, 9: 3647(J)

Statistics

(See also Biometry; Mathematics.)

application to chemistry and chemical engineering, review, 9: 3249(J)

of economics of sampling, 9: 79

efficiency of the sample median for populations of finite variance, 9: 3586

in industrial sampling, lectures on, 9: 4236

moments of the sample median, 9: 3585

rapid methods for data analysis, 9: 2844

techniques for failure testing of manufactured units, 9: 942

theory of mass behavior, 9: 3921(J)

in thermodynamics of isotope effects, 9: 1418

use of rank correlation method in, 9: 2846(J)

Steam

condensation on plane surface of flowing, 9: 4135(J)

Steam engineering

radioisotope application to stream purity determination, 9: 2696(J)

3000-Kw steam generator for SIR, design and testing, 9: 4175(R)

Steam power plants

application of liquid metals to reheating in steam turbine plant, 9: 3443

performance of Na-heated, 9: 3443

Steam–water systems

deposition of salts and temperature distribution in steam-generating pipes, 9: 3449(J)

Steatites

thermal fracture under quasi-static thermal stresses, 9: 1506(J)

thermal shock resistance, 9: 142

Steel

(See also Boron steel; Carbon steel; Chromium-nickel steel; Molybdenum steel; Nickel steel; Stainless steel.)

alloy, hard-facing with electric arcs, control measures in, 9: 220(J)

aluminum oxide coated, corrosion resistance to, 9: 191

analysis for small amounts of Al by spectrochemical method, 9: 2171(J)

austenitic, with Fe, Mn, Cr, C, N, Mo, and V, preparation and properties, 9: 3488(R)

biaxial fatigue properties of high-strength pressure-vessel, 9: 4196(J)

cast, for high-temperature plant, effect of additions, 9: 3880(J)

coating with Ni, inspection by radioautographic techniques, 9: 147

corrosion by hydraulic fluids, 9: 2795(R)

corrosion, development of coating and pretreatment for inhibition of, 9: 947(R)

corrosion and welding of metal coated, 9: 171

corrosion by water, inhibition with Na dichromate-chloramine mixtures, 9: 153

corrosion of, protective action of pigments on, 9: 2258(J)

corrosion prevention of, by metal spraying, 9: 3150(J)

corrosion testing, methods for cleaning exposed specimens for, 9: 953(J)

creep, stress-rupture, hardness, and crystal structure of, containing Cr–Mo–Ti–B, 9: 986(J)

curved-crystal x-ray spectrometric simultaneous determination of Cr, Nb, and Mo in, 9: 3435(J)

descaling methods for, corroded by high-temperature water, 9: 154

diffusion of carbon in, investigation with C^{14}, 9: 4203(J)

drip-free cementation, scale-free heating, and design of vibrator-tube furnace for continuous heat treatment of, 9: 1891(J)

ductility of SAE 1020, with different amounts of H_2, 9: 2285

effects of impurities and imperfections on the creep and hardness of, 9: 970

effects of Mn on self-diffusion in, 9: 1884(J)

electroplating with Ti, 9: 4183

etching by ionic bombardment, 9: 1280(J)

fatigue, equipment for testing, 9: 2238

fatigue and stress, 9: 4159

fatigue and tensile properties, anisotropy of, in bending and in torsion, 9: 4158

fatigue properties of pressure vessel, effect of welding, notches, attachments, and fabrication on, 9: 1889(J)

fatigue strength of, 9: 214(J)

fatigue under ranges of stress, 9: 4157

ferritic, diffusion of hydrogen in, 9: 3191(J)

hardening by addition of B, mechanism of, 9: 3857(R)

Steel (cont'd)

high-vacuum melting and casting, 9: 195(J)

hot-hardness testing of W–Cr–V and W–Cr–V–Co tool steel and Cr–W die steel, 9: 3860

hot-hardness testing of W–Cr–V and W–Cr–V–Co tool steels and Cr–W and Cr–C die steels in liquid NaK, 9: 3507

hot-tension and weld-metal cracking tests of filler-wire and base-metal compositions of, 9: 3494(R)

hydrogen embrittlement, effects on tensile strength and fatigue properties of plated and unplated high-strength, and effects of variables on, 9: 2297

hydrogen removal from plated and unplated high-strength, 9: 2297

low-alloy, spheroidize annealing, 9: 194(J)

low-alloy construction, separation of rare earths from, bibliography, 9: 4104

low-alloy, welding heavy section of, techniques and requirements for, 9: 222(J)

low-carbon, exploratory results of air-carbon arc cutting process, 9: 213(J)

machining and grinding, 9: 4174

nucleation and growth of graphite in, 9: 96(J)

plastic fatigue properties of high-strength pressure-vessel, 9: 4195(J)

radiographic inspection, evaluation of Polaroid process for, 9: 143

radiography with Tm^{170}, 9: 2241(J)

recent progress in alloy and special, review, 9: 2301(J)

roll and electrolytic cladding of Ti on, 9: 3477(R)

rolling friction, 9: 2240(J)

scattering of molecules from surface of, 9: 650

separation and spectrophotometric determination of Ti in, 9: 1199(J)

spectrophotometric determination of Nb in, 9: 4080(J)

temper brittleness of pressure vessel, 9: 3532(J)

tensile strength of spheroidize-annealed low-alloy, 9: 194(J)

thick-walled cylinders of, overstrained by internal pressure, behavior, 9: 3453

uranium-contaminated scrap, criteria for sale and shipping, 9: 3203(J)

welding of, with high-strength filler metals, 9: 3497(R)

welding of AMS 6415 low-alloy, to austenitic stainless steel, 9: 1840

welding of 20-ft-diam. test tank of, 9: 228(J)

welding procedure qualification tests on 3 pairs of high-strength pressure-vessel, 9: 4198(J)

Sterility

(See also appropriate subheadings under specific radiations and animals.)

Sterilization

(See also appropriate subheadings under materials sterilized and under radiations.)

x-ray-induced, effects of delayed oviposition on, in Habrobracon, 9: 3736(J)

of beef by γ irradiation, nature of odors formed during, 9: 2117(J)

of cheese, by γ radiation, 9: 474

of food, by γ radiation, 9: 10(R)

of food, induced by exposure to ionizing radiation, review of literature, 9: 2549

of food, induced by γ radiation role of radioresistance of bacterial spores in, 9: 33(J)

of foods and drugs, design and cost of pilot plants using spent MTR fuel rods as radiation sources for, 9: 3122

radiation, food industry's attitude toward, 9: 1714(J)

radiation, of foods and drugs, survey of organizations active in, 9: 1713(J)

radioinduced, by electron traveling-wave linear accelerator, 9: 1369(J)

radioinduced, of food and tissue transplants, 9: 1550(R)

Steroids

biosynthesis of, in isolated calf adrenals, effects of radiation on, 9: 1165(J)

Sterols

metabolism in x-irradiated yeasts, 9: 1170(J)

Stilbene

crystallization from ether, 9: 1473(J)

Stilbene crystals

response of, to fission fragments, 9: 1606(J)

Stochastic methods

(See also Mathematics, Monte Carlo methods.)

application of age-dependent, to cascade theory, 9: 813(J)

concept of sets enchained by a stochastic process and its use in cascade shower theory, 9: 1688

Storage tubes

(See Memory devices.)

Straight Cliffs Quadrangle (Utah)

photogeologic map of, 9: 3468(J)

Strain gages

(See also Extensometers.)

for cementitious materials, design and performance, 9: 2830

installation procedures for bonded-type resistance wire, 9: 4228

performance at high temperatures, experimental determination, 9: 4116

Stress analysis

of cylinders with exponential temperature distribution, 9: 4117

methods of measurement for gasket materials, 9: 3140

of plastic buckling in simply supported plates subjected to nonhomogeneous force distribution, 9: 4121

of thin-walled circular cylinders, 9: 933(J)

of welded joints, empirically determined limit curve for, 9: 217(J)

Stress corrosion

of aluminum bronze bonnets on cylinder valves, 9: 3149(J)

testing, theory, uses, influence of stress, environment, specimen orientation, surface area and finish, and time and equipment for applying stress to specimen in, 9: 2256(J)

Strontium

bone deposition of, in rats and monkeys, tracer study, 9: 3730(R)

chromatographic separation on cellulose powder, 9: 4105(J)

flame spectrophotometric determination of μg quantities of, in solution, 9: 2639(J)

isotope abundances in certain minerals, 9: 4234(R)

neutron resonances, 9: 1073(J)

spectrographic determination of, in ores and rocks, 9: 162

tissue distribution of, in animals, tracer study, 9: 1156(R)

uptake of, by bean plants, effects of environmental factors, 9: 4056

Strontium carbonate–barium carbonate–rhenium compacts

fabrication of cathodes, 9: 976

Strontium isotopes

electromagnetic separation, 9: 1593

Strontium isotopes Sr^{86}

energy levels, 9: 2069(J)

energy levels of, in $Zr^{93} \rightarrow Y^{86} \rightarrow Sr^{86}$ decay scheme, 9: 1669

Strontium isotopes Sr^{87}

isomeric transition, 9: 2953(J)

Strontium isotopes Sr^{88}

spins and parities of excited states, 9: 4282(J)

Strontium isotopes Sr^{89}

formation of bone tumors following administration of, in mice, 9: 2547(R)

yield from natural U fission, 9: 1148(J)

Strontium isotopes Sr^{90}

bone deposition of, following dietary administration, effects of Ca and PO_4, 9: 846

half life, 9: 3691(J)

hematological effects and survival time following injections of, in monkeys, 9: 2114(J)

purification, 9: 2399

thermal neutron fission yields from U^{235}, 9: 817

toxicology of, for lambs, 9: 1156(R)

use of, in a β source, 9: 836(J)

yield from natural U fission, 9: 1148(J)

Strontium–magnesium compounds (intermetallic)

crystal structure, 9: 683(J)

Strontium titanates

compacted with Pb titanates, dielectric and thermal properties and lattice dimensions of, 9: 2704(J)

Structural materials

(See Building materials.)

Structures

response to dynamic loading and shock motion, 9: 3894

shell-like, bibliography of articles and books, 9: 3439

Styrene polymers

effects of β particles on, 9: 2664(J)

effects of radiation on, 9: 3888(R)

electric conductivity and effects of radiation on, 9: 3889(R)

three-quantum annihilation of positrons in, 9: 249(J)

sulfonates of, hydration of cations in, 9: 3392(J)

Submarine Advanced Reactor

gas turbine power plant for, cycle study, 9: 3288

Submarine Intermediate Reactor

heat transfer systems, testing, 9: 4175(R)

pressure transmitter design for primary coolant system, 9: 272

Submarine power plants

gas turbine cycle study for, with Submarine Advanced Reactor, 9: 3288

Subsonic flow

(See also Supersonic flow; Transonic flow.)

local heat emission by plates in, 9: 1493(J)

Sugar phosphates

separation and identification of, by paper chromatography and ion exchange, 9: 117

Sugars

synthesis of, by reduction of aldonic lactones, 9: 3117

Sulfanilamide

acetylation and tissue distribution of, effects of total-body x irradiation on, in rats and guinea pigs, 9: 3729

Sulfate ions

activity measurements in Na_2SO_4 solutions with resin membrane electrodes, 9: 2150(J)

Sulfhydryl group

(See Mercapto group.)

Sulfide crucibles

preparation and properties of Ce, for molten Ti, 9: 2248

Sulfides

electric conductivity of, under controlled H_2S-H_2 atmosphere, 9: 2135(R)

Sulfonates

of styrene polymers, hydration of cations in, 9: 3392(J)

Sulfonates (cont'd)

synthesis of S^{35}-labeled, 9: 519

Sulfonium compounds

hydrolysis of t-butyldimethylsulfonium chloride, 9: 2646(J)

Sulfur

deposition in bone, effects of fluorine on, in swine, tracer study, 9: 1156(R)

effect of, on viscosity of alginates, 9: 2658(J)

gamma reactions (γ,d), 9: 1994(R)

gamma reactions (γ,n) and (γ,p), cross sections, 9: 3301(J)

gamma reactions (γ,p), 9: 1994(R)

μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)

nucleon total scattering cross sections, 9: 3673(J)

photonuclear reactions, 9: 2449(J)

proton total cross sections at 208 and 315 Mev, 9: 358(J)

volumetric microdetermination of, in organic compounds, 9: 80(J)

Sulfur compounds

organic, volumetric microdetermination of S in, 9: 80(J)

Sulfur dioxides

catalyzed S^{35} exchange between thionyl chloride and, kinetics, 9: 3058(J)

Sulfur fluorides

infrared spectrum, 9: 4092(J)

Sulfur isotopes S^{30}

gamma reactions (γ,p) and (γ,n), yield ratios, 9: 3300(J)

Sulfur isotopes S^{31}

beta emission, 9: 1121

beta spectrum measurement, 9: 4266(R)

Sulfur isotopes S^{32}

fast neutron detection using S^{32} (n,p) P^{32} reaction, 9: 3927

neutron reactions (n,p) and (n,α), cross sections of, for neutron energies of 2.2 to 4.0 Mev, 9: 3986(J)

Sulfur isotopes S^{33}

nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)

Sulfur isotopes S^{35}

beta decay, internal and external bremsstrahlung associated with, 9: 2969(J)

beta decay of, K-electron ejection in, 9: 1679(J)

beta spectra, measurement, 9: 437(J)

exchange between SO_2 and thionyl chloride, kinetics, 9: 3058(J)

quantitative radiographic determination of β particles from, in single cells, 9: 1734(J)

Sulfur oxides

heat and free energy of formation, 9: 529(J)

Sulfuric acid

adsorption of, by polyvalent forms of anion-exchange resins, 9: 2212(J)

atomic hydrogen hyperfine structure in, 9: 1687(J)

corrosive effects on Ti and Zr couples, 9: 3151(J)

solution of Cu_2O by, mechanism of, 9: 849

Sulphide Queen Area (Calif.)

geology, 9: 3837(J)

Sulphide Queen Gold Mine (Calif.)

exploration, 9: 3837(J)

Summerville Formation (Utah)

geology of, 9: 160

Sundance Formation (Wyo.)

geology and U distribution, 9: 956(J)

Supercritical water

(See Water.)

Supersonic flow

(See also Subsonic flow; Transonic flow.)

around thin wedge, theory, 9: 1244(J)

integration of equations of plane turbulent, 9: 1239

plane steady, integratron of equation of motion, 9: 2698(J)

recovery factor for, mathematical analysis, 9: 3809

Surface properties

effects of α particles on, 9: 2052(J)

Surface tension

estimation of, for 27 metals, 9: 207(J)

method of measuring interphase tension at high temperatures, 9: 1556

methods of measurement, 9: 2340(J)

methods of measurement of, of liquid metals and alloys, 9: 170

Surfaces

area measurements, 9: 3143

freshly formed metallic, reactivity, 9: 3542(J)

inspection of selected areas of, using replicas and the electron microscope, 9: 247(J)

interference microscope for study of, 9: 689(J)

measurement of finish quality by electric contact resistance, 9: 1948(J)

monodisperse, of spherical particles, determination of particle size and refractive index near the turbidity maximum, 9: 2798(J)

small angle scattering of x rays and neutrons by irregularities, 9: 3675(J)

Swimming pool reactors

(See Bulk Shielding Facility.)

Swine

lethal dosage determination of radiation for, 9: 1720

Synchrocyclotrons

design of CERN 600-Mev magnet, 9: 3306

short-lived radionuclides produced in, 9: 768(J)

Synchrotrons

(See also Bevatron; Brookhaven Synchrotron.)

alternating gradient, magnet configuration and stability of particle orbits in, 9: 2461

alternating gradient 25-bev proton, development of, and construction of electron analog, 9: 2099(R)

beam focusing, 9: 2456

beam inflection and magnet design for CERN machine, 9: 393

beam injection for CERN machine, 9: 771

beam intensity, energy spectrum, and deflection of protons, 9: 2460

beams, 9: 2458, 2459

betatron oscillations in, analysis of, 9: 2023

correlation of alignment errors and effect on orbit stability, 9: 399(J)

design and construction of BNL alternating-gradient, 9: 4039(R)

design and experimental facilities for CERN, 9: 390

design modifications, 9: 1723(R)

design of proton, developments in 1952 to 1954, 9: 3991(J)

experimental methods for determining acceleration frequency, 9: 4298

focusing in, with periodic field pertubation treatment, 9: 2464

focusing theory, 9: 988(R)

instrumentation, 9: 2457

magnet coils, power supply for, 9: 1098

magnet design and analysis for CERN, 9: 388

Synchrotrons (cont'd)

magnet design from measurements with $\frac{1}{3}$-scale model, 9: 2923

magnet design of CERN, 9: 1367, 1652, 4297

magnet inhomogeneities in, compensation for, 9: 1100

magnetic field measurements, 9: 391

magnetic field measurements for CERN, 9: 770, 4296

magnets, design of pole face windings for, 9: 4295

oscillations in particle orbits of strong-focusing, theory, 9: 398(J)

oscillations induced in, by radiation fluctuations, 9: 2466(J)

oscillator frequency and circuits, 9: 392

performance and research program, 9: 2890(R)

prompt destruction of electron beam in, method for and analysis of, 9: 2022

proton, mathematical determination of the pole profile, 9: 3661

solution of strong-focusing equations, 9: 1371(J)

strong-focusing, magnet inhomogeneities in, effects, 9: 2462

strong-focusing, betatron oscillations, 9: 2463

strong-focusing, numerical data for 30 bev, 9: 1101

strong-focusing, stability of, effect of section lengths on, 9: 1099

x-ray spectrum of 70-Mev, 9: 2468(J)

Synthetic rubber

(See Elastomers.)

Szilard-Chalmers reactions

in phthalocyanine metal complexes, 9: 1959(J)

T

T particles

decay energy and mass, 9: 2365(J)

Tanks

(See also Pressure vessels; Waste disposal.)

design of elevated, to withstand atomic blast, 9: 2101(J)

elevated, effects of blast from atomic explosion on, 9: 659

welding of 30-ft-diam. steel test, 9: 228(J)

Tantalum

adsorption of O_2 and CO on evaporated films of, 9: 2159(J)

anhydrous separation of, by selective chlorination of partially hydrolyzed chlorides, 9: 908(J)

anodic oxidation of, in ethylene glycol electrolytes, 9: 230

chromatographic determination of, in soil samples, 9: 3404(J)

colorimetric determination of Nb in presence of, 9: 2176(J)

compressibility parameters and Grüneisen's constants, 9: 1863

filament activation by Gd, 9: 2794

film-surface area of evaporated, measurement, 9: 3887(J)

intermetallic compound with Sn, preparation and structure, 9: 3878(J)

liquid-liquid extraction of, with hydrochloric acid from an aliphatic ketone solution, 9: 907(J)

oxidation of, under conditions of linear temperature increase, 9: 182

photonuclear reactions, 9: 2449(J)

physical properties for furnace design, review, 9: 1213

production of ductile, by Kroll process, 9: 985(J)

proton reactions of, at 32 Mev, 9: 736

proton reactions (p,n), angular distributions and yields at 23 Mev, 9: 4290(J)

radiometric determination, 9: 2634

reaction with fused NaOH, 9: 1466

Tantalum (cont'd)
spectrographic determination of, in ores and rocks, 9: 162
spectrophotometric determination of, in ores, 9: 3405(J)
thermal expansion, 9: 1266
Tantalum–aluminum–titanium alloys
hardness, crystal structure, and phase studies, 9: 3520
oxidation, 9: 3849(R)
Tantalum borides
preparation by vacuum technique, 9: 1821(J)
Tantalum carbides
properties of, effect of molten Ti on, 9: 2247
reaction of Th with, at high temperatures, 9: 1247
Tantalum compounds
toxicity, 9: 845(J)
Tantalum isotopes
evidence for second naturally occurring, of mass 181 ± 2, 9: 2400(J)
Tantalum isotopes Ta^{180}
existence in naturally occurring state, evidence for, 9: 2401(J)
Tantalum isotopes Ta^{182}
disintegration, 9: 3338(J)
gamma emission, 9: 1133
gamma spectra, 9: 4333
neutron capture cross sections, 9: 3279(J)
Tantalum isotopes Ta^{183}
disintegration, 9: 3338(J)
gamma spectra, 9: 4333
Tantalum–manganese–oxygen systems
metallic ternary phases in, 9: 3185(J)
Tantalum nitrides
crystal structure and phase studies, 9: 1273(J)
Tantalum oxide films
optical properties of thin, 9: 2805(J)
Tantalum oxides
heat and free energy of formation, 9: 529(J)
Tantalum sulfides
x-ray studies of, 9: 887(J)
Tantalum–titanium alloys
hot-rolled textures of, 9: 1836(R)
nature of quench transformation in, 9: 1844(R)
phase studies and physical properties, 9: 1528
Tantalum–zirconium alloys
fabrication and phase studies, 9: 1530(R)
preferred orientation, 9: 190(R)
Targets
(See Radiation targets.)
Technetium
detection, radioactivity, and separation, 9: 1590
Technetium isotopes
relative abundance, 9: 1590
Technetium isotopes Tc^{95}
gamma emission, 9: 743(J)
Technetium isotopes Tc^{99}
natural occurrence of, in Mo minerals, 9: 664(J)
occurrence in nature, 9: 2787
Technetium isotopes Tc^{99}
formation in stars by neutrinos, 9: 1914(J)
Technetium isotopes Tc^{102}
half lives of, 9: 448(J)
Technetium isotopes Tc^{104}
half lives of, 9: 448(J)
Technetium oxides
heat and free energy of formation, 9: 529(J)
Tecolote District (N. Mex.)
exploration of, 9: 955(J)
Teeth
developing, pathological effects of radiation on, in rats, 9: 484(J)
Teflon
(See Ethylene, tetrafluoro- polymers.)
Tellurium
anion exchange separation, 9: 3109(J)
reaction with dichlorodifluoromethane, 9: 3419(J)
Tellurium fluorides
infrared spectra and molecular structure of TeF_6, 9: 3410
Tellurium–iron systems
surface tension, 9: 2702(R)
Tellurium isotopes Te^{134}
angular correlations, 9: 1067(R)
Tellurium isotopes Te^{129}
decay scheme, 9: 1994(R)
Tellurium isotopes Te^{131}
disintegration, 9: 3336(J)
Tellurium isotopes Te^{132}
metabolism of mixtures of I^{132} and, in rats and guinea pigs, 9: 3754(J)
Tellurium oxides
heat and free energy of formation, 9: 529(J)
vaporization, 9: 2627(J)
Tellurium–thorium systems
phase studies, 9: 1192(J)
Temperature
effects of high, on survival and cleavage of irradiated Ascaris eggs, 9: 2571(J)
effects of, on radiation injuries in seed of barley, 9: 2503(J)
of gases, probes for measurement, design, 9: 3578
measurement of, performance of Temp-Tape containing alloys, 9: 2335
miniature recorders for flight use, design, 9: 3915
Temple Mountain District (Utah)
mineralogy, 9: 1829
Tennessee Univ.
progress reports on decomposition of eutectoids in alloy systems, 9: 1265(R)
progress reports on effect of wetting on heat transfer characteristics of liquid metals, 9: 1807(R)
progress reports on radiobiological research, 9: 1156(R)
Tennessee Valley Authority
report lists, 9: 468(J)
Tennessee Valley Authority, Wilson Dam, Ala.
progress reports on utilization of Florida leached zone material, 9: 1183(R), 1746(R)
Terbium
tissue distribution of, in rats, tracer study, 9: 3730(R)
Terbium isotopes Tb^{159}
nuclear magnetic moment and spin, 9: 3627(J)
Terbium isotopes Tb^{160}
internal conversion, 9: 1994(R)

Terbium isotopes Tb^{161}

fission yield of, from natural U, 9: 1700(J)

Terbium oxides

dissociation pressures of, by x-ray and differential thermal analysis, 9: 111(J)

preparation of, by high-pressure molecular O treatment, 9: 903(J)

Terephthalic acid, ethylene polymer esters

electric conductivity of, induced by x radiation, 9: 4013(J)

Testes

(See Gonads.)

Tetrathionates

spectrophotometric determination, 9: 3779

Tetryl

detonation velocities of, 9: 3214

Textiles

(See also Clothing.)

bonding to textiles and to class Al and alloys, 9: 651

diffuse reflectance, 9: 2521(J)

a light poncho material, thermal shielding properties, 9: 4050

protective effects of assemblies of, against radiant energy burns in pigs, 9: 1157

thermal shielding properties, 9: 481

Thallium

nuclear magnetic moments, 9: 2895

photochemical effects of, 9: 1784

radiochemical determination, 9: 876

spectrographic determination of, in ores and rocks, 9: 162

Thallium alloys

nuclear magnetic moments, 9: 2895

Thallium bromides

lattice constants, 9: 3408

Thallium chlorides

crystal structure, 9: 544(J)

lattice constants, 9: 3408

solubility, 9: 1784

Thallium fluorides

preparation and heat of formation, 9: 2158(J)

Thallium halides

microwave spectra, 9: 731(R)

Thallium–indium alloys

diffusionless phase transformation, crystal structure, heat treatment, and effects of tensile and compressive stresses, 9: 1861(R)

thermal conductivity of, at low temperature, 9: 3202(J)

Thallium isotopes

decay schemes of neutron-deficient, 9: 3689(J), 3690(J)

isomeric levels and transitions of neutron-deficient, 9: 3688(J)

Thallium isotopes Tl^{203}

Coulomb excitation and γ spectra, 9: 4275(J)

Thallium isotopes Tl^{204}

beta spectrum, 9: 2959(J)

decay scheme, 9: 2963(J)

electrodepositing technique for, on Cu preparation of high-energy β source by, 9: 1289(J)

Thallium isotopes Tl^{205}

Coulomb excitation and γ spectra, 9: 4275(J)

nuclear magnetic resonance in metallic thallium and thallium oxide, measurements and theory, 9: 3972(J)

Thallium isotopes Tl^{208}

milligram radium equivalent of, 9: 1342(J)

spin assignments, 9: 2974(J)

Thallium oxides

heat and free energy of formation, 9: 529(J)

Thallium–silver alloys

diffusion of Ag and Tl in, 9: 188(R)

Thermal conductivity

(See also appropriate subheadings under specific materials; see also Heat transfer.)

apparatus for measuring, of metals in vacuum at high temperatures, 9: 3554(J)

bibliography on determination of, of metals at elevated temperatures, 9: 1535

equipment for measurement, 9: 99

equipment for measurement of, of metals and alloys, 9: 989

measurement of, at high temperatures, 9: 1564(J), 2822(J)

of metals at high temperatures, theory and design and performance of equipment for measurement, 9: 1502

methods of measurement, 9: 1252

Thermal conductivity cells

design of, for measuring temperature distribution in steel–Hg–steel systems, 9: 1807(R)

Thermal conductometric analysis

of ortho-para hydrogen mixtures, equipment for, 9: 3399(J)

Thermal diffusion

columns, performance of hot-wire, 9: 4095(J)

in liquids, theory, 9: 2797(J)

Thermal injuries

(See Burns.)

Thermal insulation

(See also Ceramic materials; Thermal radiation shielding.)

properties of castable, for use in fabricating adhesive bonding presses, 9: 4114(R)

sodium reactivity and performance tests, 9: 4122

testing of, in liquid Na, 9: 4175(R)

Thermal neutrons

activities produced by, tables for simplifying calculations of, 9: 2514(J)

chromosome breakage and rejoining capacity following exposure to, in Trillium, 9: 1154

detection and measurement of, by borazole filled proportional counters, 9: 2417

detection and measurement of, with scintillation counters, 9: 1036

diffusion parameters in H_2O, 9: 1387(J)

effect of exposure to, on barley seed, 9: 3369(J)

effects of exposure to, on lethality, atrophy of small intestine and Fe^{59} uptake and red blood cells in rats, 9: 1711

effects of exposure to, on survival of E. coli, 9: 2099(R)

effects on chromosomal aberrations and rejoining, in Trillium, 9: 476

energy spectra and inelastic scattering by Cu, Be, Al, and Pb, 9: 3326(J)

late biological effects of, in mice, 9: 20(J)

magnetic scattering of, from O_2 gas, 9: 2487(J)

polarization of, by noncrystalline ferromagnets, 9: 1627(J)

relative biological effectiveness of, in mammalian systems, compared with effects of other radiations, 9: 3007

small angle scattering by surface irregularities, 9: 3675(J)

transport mean free path in D_2O at 13°C, 9: 2476(J)

Thermal radiation

(See also appropriate subheadings for effects on specific devices, materials, and organisms; see also Heat transfer; Infrared radiation.)

detection and measurement, design of a spectrometer for, 9: 916

response of skin to, effect of color on, in swine, 9: 4045

Thermal radiation shielding

effectiveness of a light poncho material for, 9: 4050

effectiveness of fabrics as, against flash burns of skin, 9: 481

effectiveness of textile assemblies for, in pigs, 9: 1157

Thermal radiation sources

calibration of, performance of spectrometer, 9: 916

design, 9: 234

Thermal reactors

(See also specific thermal reactors.)

temperature rise in, as result of cooling, 9: 2015(J)

thermal utilization in large heterogeneous, 9: 3981(J)

Thermal rupture

of ceramic materials under quasi-static thermal stresses, 9: 1506(J)

effects of porosity on, 9: 1507(J)

effects of shape on, 9: 1503(J)

of spherical shapes, 9: 1497(J)

testing of materials by resistance to, 9: 1496(J)

theory, for brittle materials, 9: 142

Thermal stresses

bibliography on, 9: 4211

resistance of ceramic materials to factors affecting, 9: 1505(J)

Thermochromism

in bianthrone and bixanthylene, LCAO MO study of, 9: 2144(J)

Thermocouples

calibration and development of, 9: 185

effects of high neutron flux on, 9: 429

measurement of emf, potentiometer for, design and performance, 9: 1581

microscope attachment for observing high-temperature phenomena, 9: 1589(J)

potentials recording of, 9: 2386

Thermodynamic properties

bibliography on, of elements, 9: 657

Thermodynamics

analysis of low-temperature irreversible thermodynamic processes, 9: 238(J)

effect of degree of dispersion of phases on equilibrium, 9: 63

of ion exchange systems, 9: 116

statistical, of isotope effects, 9: 1418

Thermonuclear explosions

cumulative effects on surface of earth induced by, 9: 818(J)

effects of, on the weather, 9: 3274(J)

Thermonuclear reactions

electron screening effects on rate of, 9: 733(J)

in stars, involving protons on light nuclei, 9: 3647(J)

Thickness gages

induction and x-ray types, design for measuring band thickness in rolling, 9: 1947(J)

radiometric, for thin α-active layers, design, 9: 1236

x-ray, design, 9: 1983(J)

6-Thioctic acid

(See Caprylic acids, thio-.)

Thiocyanates

potassium, effects on accumulation of At^{211} and I^{131} by thyroid gland, 9: 1709(J)

Thiols

adsorption of, on Zn minerals, 9: 166(J)

Thionyl chloride

catalyzed S^{35} exchange between SO_2 and, kinetics, 9: 3058(J)

Thorianites

x-ray studies, 9: 1233(J)

Thorium

chemical determination of, in Al–Th alloys, 9: 1759

cosmic abundance of, in chondritic meteorites, 9: 3065(J)

determination and separation from U by 2,4-dichlorophenoxyacetic acid, 9: 3782(J)

determination in Mn nodules of ocean sediments, 9: 3819(J)

determination of, in minerals with proportional counters, 9: 957(J)

determination of, in mixtures with Fe, Zr, and Ti, by use of 2,4-dichlorophenoxyacetic acid, 9: 2641(J)

determination of trace amounts of, in ores, 9: 81(J)

determination with aryl fatty acids, 9: 2168(J)

dissolution of, in acids, 9: 2783(J)

exploration for, book, 9: 960(J)

extraction by mesityl oxide, 9: 2674(J)

gravimetric determination of, in rare earth and U by precipitation with hydroxy toluic acid, 9: 2643(J)

gravimetric determination with 5-iodo-anthranilic acid, 9: 2642(J)

ion exchange of, from Ac and Ra at high temperatures, 9: 593(J)

lattice defects and electrical resistivity, 9: 2330

proton reactions (p,f), (p,n), and (p,3n), excitation functions and cross sections, 9: 4288(J)

proton reactions (p,n), angular distributions and yields at 23 Mev, 9: 4290(J)

radiometric determination, 9: 2634

reaction of, at high temperatures with refractory compounds, 9: 1347

recovery and estimation from industrial wastes with organic reagents, 9: 4079(J)

recovery from monazite sands, 9: 592(J)

room- and elevated-temperature mechanical properties and heat treatment, 9: 3840(R)

separation and estimation from cerite earths, 9: 594(J)

separation by precipitation and polarographic determination of minute quantities of, 9: 883(J)

separation from coral limestone samples for radiometric determination of Th^{230}, 9: 1762

spectrophotometric determination of, in presence of Ce and La, 9: 83(J)

titrimetric determination, 9: 875

toxicology of, results of an industrial hygiene survey on a thorium refinery, 9: 3375(J)

volumetric determination with anthranilic acid, 9: 2642(J)

Thorium–aluminum alloys

chemical analysis of, for Th, 9: 1759

Thorium–aluminum compounds (intermetallic)

crystal structure, 9: 3237(J)

Thorium chelates

with 8-quinolinol, precipitation of, and separation from Ce and La, 9: 83(J)

Thorium complexes

with Alizarin Red S, chemical properties, 9: 875

Thorium deposits (Idaho)

occurrence, 9: 1520(J)

Thorium deposits (Mont.)
occurrence, 9: 1520(J)
Thorium hydroxides
colloid suspensions, electrolyte effects on surface of, 9: 1193(J)
Thorium ions
hydrolysis of, 9: 1470(J)
Thorium isotopes
ingestion by luminous dial workers, late pathological effects, 9: 40(J)
Thorium isotopes Th^{226}
decay and low-lying states of spin 1– in, 9: 1633(J)
Thorium isotopes Th^{227}
half lives, 9: 2952
Thorium isotopes Th^{228}
decay and low-lying states of spin 1– in, 9: 1633(J)
decay schemes and conversion electrons, 9: 383(J)
gamma emission, energy measurement by secondary electron absorption, 9: 809(J)
Thorium isotopes Th^{230}
angular correlations, 9: 2901(J)
decay schemes and conversion electrons, 9: 383(J)
internal conversion spectrum, 9: 381(J)
radiometric determination of, in coral limestone, 9: 1762
Thorium isotopes Th^{232}
fission and total cross sections for 22-Mev protons on, 9: 738(J)
thermal neutron activation cross sections, 9: 3970(J)
Thorium isotopes Th^{234}
preparation of carrier-free, 9: 876
Thorium–magnesium alloys
determination of solubility of Th in Mg at 1050°F, 9: 4161(R)
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)
Thorium–magnesium alloys (liquid)
electromagnetic pump and heating transformer for, design, 9: 931
Thorium–magnesium–zirconium alloys
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)
Thorium minerals
glossary and chemical classification of, 9: 3465(J)
occurrence in Alaska, 9: 1523(J)
Thorium–molybdenum–tungsten alloys
forging in inert gas, 9: 984(J)
Thorium nitrates
preparation of anhydrous, by thermal decomposition of $Th(NO_3)_4 \cdot 2N_2O_5$, 9: 2224(J)
reaction of tetrahydrate of, with nitrogen oxides to form $Th(NO_3)_4 \cdot 2N_2O_5$, 9: 2224(J)
Thorium ores
analysis of, for Th traces, 9: 81(J)
Thorium oxide crucibles
preparation and properties of, for molten Ti, 9: 2246
Thorium oxide crystals
polarization, 9: 3553(J)
Thorium oxide–rhenium compacts
fabrication, mechanical properties, microstructure, and thermionic emission, 9: 976
Thorium oxide–titanium systems
hardness and microstructure, 9: 2246
Thorium oxide–uranium oxide systems
chemisorption of O_2 on, 9: 603(J)
oxidation of, phase diagrams, 9: 1796(J)
preparation, crystal structure, phase studies, density, and oxidation, 9: 602(J)
Thorium oxides
clinical uses, late pathological effects, 9: 40(J)
properties of, effect of molten Ti on, 9: 2246
reaction of Th with, at high temperatures, 9: 1247
Thorium(IV) oxides
change of apparent density, rate of solution in HCl, and thermal and x-ray analysis, 9: 1184(J)
separation from rare earths with urotropine, 9: 3431(J)
Thorium–rhenium alloys
fabrication and microstructure of arc-melted, 9: 976
Thorium–tellurium systems
phase studies, 9: 1192(J)
Thorium–titanium alloys
surface hardening by nitridation, 9: 978(R)
Thulium
spectra, hyperfine structure of, 9: 2204(J)
Thulium chlorides
crystal structure, 9: 544(J)
Thulium isotopes Tm^{169}
nuclear magnetic moments, 9: 2204(J)
Thulium isotopes Tm^{170}
radiographic applications, 9: 2241(J)
Thymonucleic acids
(See Nucleic acids.)
Thymus
formation of tetanus antitoxin by, 9: 2099(R)
nucleic acid content of cells of, effects of irradiation on, in mice, 9: 2558(J)
Thyroid diseases
correlation between renal function and I^{131} clearance in hyperthyroidism, and myxedema, 9: 1180(J)
diagnosis of, by differential uptake of I^{132}, 9: 1179(J)
diagnosis of, by early radioiodine uptake and renal excretion patterns, 9: 1463(J), 1464(J)
diagnosis of, by thyroidal uptake of I^{131}, 9: 3047
diagnosis, by uptake of I^{131}, counting method, 9: 46(J)
diagnosis of, by uptake of I^{131} following administration of desiccated thyroid, 9: 507(J)
radiotherapy of, with I^{131}, prediction of uptake based on uptake of tracer dose, 9: 45(J)
therapeutic effects of I^{131} in treatment of hyperthyroidism and thyrotoxic myopathy, 9: 3749(J)
tumors treated with I^{131}, γ isodose measurements over entire body, 9: 2605(J)
uptake of I^{131} in carcinomas, 9: 500(J)
Thyroid gland
accumulation of At^{211} and I^{131} by, effects of KSCN and thyroxine on, 9: 1709(J)
bibliography on, 9: 3004
clearance of I^{131} by, 9: 2603(J)
early uptake of I^{131} by, following intravenous administration, 9: 1463(J), 1464(J)
effect of radioinduced thyroidectomy on uptake of I^{131} by muscle and malignant melanoma tissue, 9: 3028(J)
growth characteristics and radioiodine uptake of autotransplanted and in situ lobes of, in rats, 9: 2543(J)
improved tracer techniques for study of, 9: 1737(J)
influence of pituitary hormones on, in toads, 9: 2550
localization of protein-bound I^{131} in mouse, autoradiographic demonstration, 9: 1178(J)
metabolism of iodine by, effects of dietary fluorine on, tracer study, 9: 2610(J)

Thyroid gland (cont'd)
radioinduced changes in, effects of hypophysectomy and of thyroxine on, in rats, 9: 2113(J)
radioinduced deficiency of, effects on bone growth in mice, 9: 485(J)
removal of radioinduced destruction of, effects on induction of pituitary tumors, 9: 1450
report of symposium on, held at Brookhaven National Lab., 9: 3004
of salmon parr, effects of radiation from ingested I^{131} on, 9: 828(J)
uptake of I^{131} by, effects of free iodide and of phenothiazine on, in rats, 9: 508(J)
uptake of I^{131} by, effects of liver diseases on, 9: 490(J)
uptake of I^{131} by, of hypophysectomized rats, effects of direct and explant-transplants of anterior pituitary, 9: 1733(J)

Thyroxine
distribution of, in rabbit brain, tracer study, 9: 2099(R)
effects of dietary, on dairy cows, 9: 1156(R)
effects on accumulation of At^{211} and I^{131} by thyroid gland, 9: 1709(J)
effects on radioinduced histologic changes in thyroid gland of rats, 9: 2113(J)

Thyroxine, 3,5-diiodo-
distribution in rabbit brain, tracer study, 9: 2099(R)

Tidwell Quadrangle (Utah)
photogeologic map of, 9: 3159(J)

Timing circuits
design, for meson decay experiments, 9: 303
design of, for half-life measurements, 9: 2951
time-delay analyzer, multi-channel recording, design of, 9: 1943

Tin
absorption of cosmic μ mesons, 9: 721
anion exchange separation, 9: 3109(J)
characteristic x-ray spectrum by β excitation, 9: 2950
corrosion of, in 95°C, low-conductivity, aerated, distilled water, 9: 2725
cross sections for neutron transmission and multiplication, 9: 3646(J)
detection of, in presence of Al by colorimetric spot tests, 9: 1196
diffusion of, in single crystals of Ag, tracer study, 9: 668(J)
electroforming from fluoborate baths, 9: 3495
energy loss of secondary electrons in a cavity with walls of, 9: 2045(J)
external bremsstrahlung emitted from P^{32} β rays stopped in, 9: 2505(J)
gamma penetration, tables and graphs, 9: 2472
heats of solution of Cd–Ag alloys, Cd, Au, and Ag in liquid, 9: 4178
intermetallic compounds with Nb, Ta, and V, preparation and structure, 9: 3878(J)
iodometric determination of, in Nb–U ternary alloys, 9: 4074
neutron differential scattering cross sections at 3.7 Mev, 9: 4204(R)
neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)
nuclear magnetic moments, 9: 2895
proton reactions (p,γ), 9: 1066(R)
proton stopping cross section, 9: 2026
radiochemical determination, 9: 876
separation and determination of, by electrochemical means, 9: 87(J)
solubility of, in $SnBr_2$, 9: 3052
spectra, isotope shift in, 9: 1415(J)
spectrographic determination in Bi, 9: 1475
spectrographic determination in Ti and Ti alloys, 9: 639(R)
spectrographic determination of, in ores and rocks, 9: 162
volumetric determination of, in Ti alloys, 9: 89(J)

Tin (liquid)
heat-transfer film coefficient of flowing, in graphite, 9: 139

Tin–aluminum–titanium alloys
hardness, crystal structure, and phase studies, 9: 3520
high-temperature tensile properties of annealed sheet and bar, 9: 3198(J)
spot welded joints in, 9: 1839(R)

Tin–aluminum–titanium–vanadium alloys
fabrication and physical properties, 9: 2717(R)

Tin–aluminum–zinc alloys
corrosion of, in 95°C, low-conductivity, aerated, distilled water, 9: 2725

Tin–bismuth alloys
changes in properties of, due to crystallization, 9: 4199(J)

Tin bromides (liquid)
solubility of Sn in, 9: 3052

Tin coatings
on steel, corrosion and weldability of, 9: 171

Tin–copper alloys
heats of formation and precipitation in, calorimetric investigation of, 9: 199(J)

Tin iodides
solubility of, in a perfluoroamine and a perfluoroether, 9: 95(J)

Tin isotopes Sn^{117}
angular correlations, 9: 4318
energy levels from decay of In^{117} and Sb^{117}, 9: 2056(J)

Tin–magnesium alloys
corrosion of, in 95°C, low-conductivity, aerated, distilled water, 9: 2725

Tin–molybdenum alloys
martensitic transformations in, 9: 200(J)

Tin–nickel alloys
surface tension, 9: 2702(R)

Tin oxides
dielectric properties and solid-state reactions of, with binary, ternary, and quaternary systems of CaO, MgO, and TiO_2, 9: 3820(J)
heat and free energy of formation, 9: 529(J)

Tin–titanium alloys
densities, melting points, and thermal and x-ray diffraction analyses of various phases in heat-treated, 9: 2281(R)
hydrogen equilibrium pressure and temperature in single phase, 9: 2329(J)
volumetric determination of Sn in, 9: 89(J)

Tin–zinc alloys
corrosion of, in 95°C, low-conductivity, aerated, distilled water, 9: 2725

Tin–zirconium alloys
corrosion in water and aqueous media at 600 and 680°F, 9: 1822
fabrication, 9: 1530(R)
preparation, fabrication, and effect of hot forming heat treatment on mechanical properties and grain size, 9: 966

Tissue cultures
of excised anthers of Trillium, an evaluation of 8 media, 9: 3718(J)
growth, effects of electrons and x radiation, 9: 3016(J)
of human bone-marrow cells, uptake of Fe^{59} and effects of irradiation, 9: 3011(J)

Tissue homogenates
adenosine triphosphatase activity in, effects of radiation, 9: 2587(J)
protective effects of, against radiation injuries, 9: 3600(J)
radiosensitivity effects of, in mice, 9: 37
of spleen, effects of injected, on adenosine triphosphatase activity, spleen weight, and leukocyte count in irradiated mice, 9: 38(J)

Tissue homogenates (cont'd)

spleen, effects on radiation injuries in mice, 9: 2596(J)

spleen, effects of storage on protective effects against radiation injuries in mice, 9: 2594(J)

of spleen and bone marrow, effects of treatment with enzymes and trypsin on radiation recovery factor, 9: 3370

Tissues

(See also specific tissues; see also Connective tissue.)

absorption of x radiation by, 9: 2038(J)

from adrenal cortex, autotransplants of, effects of x irradiation on growth and histochemistry, in rats, 9: 22(J)

animal, chromatographic analysis of, for corticosteroids, 9: 3365

animal, sample preparation for chemical analysis, 9: 53

determination of boron and boron compounds in, 9: 53

determination of sulfhydryl levels in, from rats, 9: 18

effects of radiation on biochemistry of, 9: 2548(R)

histopathology, and nucleic acid and other biochemical constituents of, effects of radiation on, in rats, 9: 480(R)

living, ionization of heavy nuclei from cosmic radiation in, 9: 3362

preparation of elastic, for electron microscopy, 9: 1707(J)

preparation of samples of thyroid, for codetermination of I^{127}, I^{131}, and At^{211}, 9: 1477

radiation dosage determinations in, 9: 3256(J)

radiosensitivity, factors affecting, 9: 3015(J)

skin and mesentery, mast cell counts in, effects of various treatments, 9: 3(R)

surface measurement of β activity in, in vivo, 9: 8(J)

transplants of aorta and bone, effects of γ irradiation on, in dogs, 9: 1550(R)

Titanate compacts

refractory properties of Al titanate–Mg titanate or Al titanate–Fe titanate, 9: 3844(R)

Titanium

absorptiometric analysis of, for Mg, 9: 1198(J)

alloy weld joints in, improving toughness and strength of, 9: 225(J)

alloy welds in, mechanical properties and structure, 9: 2299

analysis, fabrication, metallurgy, and properties, 9: 2730

analysis and hydrogen embrittlement in, 9: 3183

analysis of, for H, 9: 3077(J)

casting and mechanical properties of as-cast and wrought, 9: 184

chemical analysis, review, 9: 4200(J)

cladding of, to steel with Cr, Co, Fe, Mo, and Ni as bonding agents, 9: 4182

combustion analysis of, for O, 9: 1197

combustion in air and O_2 and physical properties, 9: 3498(R)

composition, availability, mill forms, alloy grades, forming, welding, and properties of, reference sheet for, 9: 3199(J)

corrosion by liquid Na, 9: 1904(R)

corrosion in fused salts, formation of pyrosols, 9: 1255(J)

corrosion in high-temperature waters, 9: 3450

corrosion resistance and applications, 9: 4202(J)

coupled to Al alloys and stainless steel, galvanic corrosion in H_2SO_4 solutions, 9: 3151(J)

creep and rupture behavior and tensile properties of, in temperature range 600 to 1000°F, 9: 1268

creep and rupture behavior at 600 to 1000°F, 9: 3483

creep of Ti 75A, 9: 168(R)

creep properties of, under intermittent stressing and heating conditions, 9: 3521

Titanium (cont'd)

descaling and bright pickling, 9: 1838(R)

determination of, in mixtures with Th, Zr, and Fe, by use of 2,4-dichlorophenoxyacetic acid, 9: 2641(J)

diffusion and vacuum extraction determination of H in, 9: 981(J)

diffusion of C in, 9: 1859

diffusion of N and O in, 9: 2339(J)

dissolution and passivation of, in acids in presence of NH_4F, 9: 2146(J)

dissolution of, in acids, 9: 2783(J)

drop-hammer stamping and forming with trapped rubber, 9: 1847(R)

effect of H on the mechanical properties of, 9: 2749(J)

effect of repeated loading on fatigue properties and mechanical properties of, 9: 977

effects of Al and Sn on the $\alpha \rightleftharpoons \beta$ transformation in, 9: 2329(J)

effects of ceramic coatings and heat treatment on oxidation and impact strength of, 9: 3868

effects of annealing on grain size, 9: 1847(R)

effects of grain size on the mechanical properties of, 9: 1837(R)

effects of heat treatment on mechanical properties and microstructure, 9: 2304(J)

electrodeposition of, from aqueous, nonaqueous, and fused-salt electrolytes, 9: 1895

electrodeposition of, from Ti/fused salt/Pt cell, 9: 3067(J)

electrodeposition of, on base metals, 9: 4183

electroplating and roll-bonding of, with Ni, Fe, and Cr, 9: 3477(R)

embrittlement in atmospheres of H_2, O_2, N_2, and air of ceramic coated and uncoated, at 1500 and 1700°F, 9: 1880(J)

fabrication and mechanical properties, 9: 3858

fatigue behavior of spot-welded joints in, 9: 1849(R)

fatigue, effect of internal heating on, 9: 1533

fatigue, effects of rolling and grinding on, 9: 962(R)

fatigue properties of Ti-75A, effects of surface treatment, 9: 3842(R)

formation and removal of twins in, during deformation, 9: 2324(J)

friction testing of halogenated hydrocarbon lubricated, 9: 961(R)

galling, sliding friction, and interface temperature, 9: 1271

galling and seizing of, by friction coefficients, 9: 1269

galling and seizing in, prevention of, 9: 2745(J)

general physical metallurgy, a review of, 9: 2750(J)

grain growth on recrystallized arc-melted sponge Ti-75A, 9: 3872(R)

hardness, 9: 3854(R)

hardness, microstructure, and tensile properties of parent stock and welded, 9: 968

high-temperature alloy fusion brazing of, 9: 645(J)

history, production, properties, metallurgy, and uses, seminar on, 9: 1281(J)

impact properties of arc-melted, 9: 2717(R)

machining, control of materials, tools, and machines in, book on, 9: 2[illegible]

machining and grinding, 9: 4174

mechanical properties, effect of H on, 9: 1857

mechanical properties and microstructure of extruded and heat treated, effects of temperature, pressure, and die angle on, 9: 2276(R)

mechanical properties of, effect of alloying elements, 9: 3539(J)

mechanical properties of, effects of grain size and heat treatment on, 9: 3492(R)

mechanical properties of commercially pure, effect of low temperatures on, 9: 3205(J)

mechanical properties of weld joints in unalloyed, 9: 215(J)

mechanical properties of welded, 9: 1859

Titanium (cont'd)

melting and casting, 9: 3847

metallurgical evaluation of Al_2O_3, BeO, ZrO_2, ThO_2, and Gd_2O_3 crucibles for molten, 9: 2246

metallurgical evaluation of Ti, Zr, and Cr boride and Ce sulfide crucibles for molten, 9: 2248

microstructure, 9: 3868

microstructure and hardness of spot and arc welds of Ti-75A, 9: 3493(R)

microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed and cold worked, 9: 2296

molybdenum coated, wear resistance, 9: 2752(J)

neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)

oxidation of, under conditions of linear temperature increase, 9: 182

permeability and mechanical properties, conference, 9: 2284

permeability to nitrogen, 9: 978(R)

phase structures of heat-treated, 9: 2279(R)

physical properties and effects of alloying metals on, 9: 2738(R)

plastic deformation and preferred orientation, 9: 1836(R)

plastic flow, slip, and twinning in coarse-grained sponge and iodide Ti-75A from −196 and 800°C, 9: 3872(R)

polarization of, in 3% NaCl solution, 9: 2259(J)

polarographic behavior and determination of, in H_2SO_4, 9: 538(J)

powder metallurgy, review, 9: 2302(J)

preparation by nonconsumable and consumable electrode arc melting, 9: 2293(R)

production, chemical engineering aspects of, 9: 647(J)

production, metallurgy, and properties, 9: 2286, 2287, 2288, 2289, 2290, 2291, 2292

purity, properties, heat treatment, fabrication, welding, machining, and cleaning, book, 9: 1892(J)

reaction of, with red-fuming nitric acid, accident report, 9: 3456(J)

reaction with fused NaOH, 9: 1466(R)

relaxation, equipment for testing, 9: 3505(R)

relaxation of, effect of microstructure on, 9: 3506(R)

resistance sintering under pressure, 9: 1878(J)

resistance spot and inert arc welding, 9: 968

roll and electrolytic cladding of steel with, 9: 3477(R)

separation from O by vacuum sublimation, 9: 2209(J)

separation of, by anion exchange, 9: 912(J)

separation and spectrophotometric determination of, in steel, 9: 1199(J)

slip modes, occurrence during tensile deformation, 9: 643(J)

spectrographic analysis for B, Fe, V, Al, Cr, Sn, Co, and W, 9: 639(R)

spectrographic determination of, in ores and rocks, 9: 162

spectrophotometric determination of, in ores, 9: 3405(J)

spot welded joints in, 9: 1839(R)

spot welding of, 9: 224(J)

strength, effects of oxidation and temperature, 9: 2282(J)

surface friction, 9: 3487(R)

surface treatment of, for oxidation protection, symposium on, 9: 2283

tensile and notched impact tests on hot-rolled and annealed Ti-75A, 9: 3872(R)

tensile properties, 9: 3521

tensile properties, recrystallization, and grain growth of Ti-75A, 9: 3873(R)

tensile properties, welding, and galling, 9: 3843(R)

tensile properties and ductility, 9: 1848(R)

tensile properties at room temperature, effects of creep test conditions on, 9: 2275(R)

Titanium (cont'd)

tensile properties of forged and welded, 9: 1529

tensile properties of seamwelded, 9: 1838(R), 1847(R)

thermal expansion, 9: 1266

transition temperatures of iodide, 9: 175(R)

use in aircraft of the future and mechanical properties, 9: 3200(J)

use in chemical industry, corrosion, fabrication, and properties, 9: 1542(J)

vacuum etching of, in high temperature β phase, 9: 2757(J)

vapor deposition of Mo on, 9: 2752(J)

welding without filler rod, properties of weld produced by, 9: 3197(J)

wetting of, with Hg, 9: 2766(J)

x-ray spectra (soft), 9: 452(J)

Titanium alloys

absorptiometric analysis of, for Mg, 9: 1190(J)

analysis, fabrication, metallurgy, preparation, and properties, 9: 2730

analysis and hydrogen embrittlement in, 9: 3183

analysis of, for H, 9: 3077(J)

binary, analysis of quench products and mechanism of tempering in various, 9: 1842(R)

casting and forging for gas turbine application, 9: 3869

chemical and spectrographic analysis, 9: 3518

colorimetric analysis of, for Si, 9: 2632

combustion analysis of, for O, 9: 1197

corrosion resistance and applications, 9: 4202(J)

creep and rupture behavior and tensile properties of, in temperature range 600 to 1000°F, 9: 1268

creep and rupture behavior at 600 to 1000°F, 9: 3483

design of an electrostatic apparatus for dynamic elastic moduli determinations, 9: 2293(R)

development of all-α sheet, 9: 2717(R)

effects of composition and heat treatment on the mechanical properties and microstructure of α, β, and α' phases, 9: 2304(J)

fatigue, effect of internal heating on, 9: 1533

fatigue, effects of rolling and grinding on, 9: 962(R)

fatigue tests of seam-welded, 9: 3500

forging in inert gas, 9: 984(J)

galling, sliding friction, and interface temperature, 9: 1271

growth of nitrided, 9: 978(R)

hardness and phase studies, 9: 3524

high-temperature alloys fusion brazing of, 9: 645(J)

history, production, properties, metallurgy, and uses, seminar on, 9: 1281(J)

hydrogen removal by vacuum-diffusion annealing, effect on ductility of heat-treated, 9: 1845(R)

machining and grinding, 9: 4174

machining, control of materials, tools, and machines in, book on, 9: 208(J)

machining of Ti-150A, dynamometer measurements as aid for, 9: 2779(J)

mechanical properties, conference, 9: 2284

mechanical properties, effects of microstructure on, 9: 4176, 4177

mechanical properties and creep of heat-treated iodide and sponge, at room and elevated temperatures, 9: 1845(R)

mechanical properties of, effect of alloying elements, 9: 3539(J)

melting and casting, 9: 3847

metallurgy and properties, 9: 1267(R), 2286, 2287, 2288, 2289, 2290, 2291, 2292

molybdenum coated, wear resistance, 9: 2752(J)

physical properties, 9: 2738(R)

Titanium alloys (cont'd)
preparation of, with added Al, Cr, Mn, C, Fe, N, and W, 9: 3518
properties of commercial, 9: 1892(J)
relaxation behavior and tensile properties of, 9: 1858(R), 3176(R)
relaxation of, effect of microstructure on, 9: 3506(R)
spectrographic analysis for B, Fe, V, Al, Cr, Sn, Co, and W, 9: 639(R)
spectrophotometric analysis of, for Fe, 9: 84(J)
spot-welded joints in, fatigue behavior, 9: 3491(R)
surface friction, 9: 3487(R)
tensile properties of forged and welded, 9: 1529
vapor deposition of Mo on, 9: 2752(J)
welds, effect of O and N contamination levels on, 9: 226(J)
welds of, mechanical properties and structure, 9: 2299

Titanium aluminides
metallurgical properties, survey, 9: 3822(J)

Titanium–aluminum alloys
casting and mechanical properties of as-cast and wrought, 9: 184
casting and powder metallurgy, 9: 3849(R)
creep and rupture behavior at 600 to 1000°F, 9: 3483
creep and tensile properties of as-forged, effect of structure on, 9: 2279(R)
creep deformation of, 9: 175(R)
effects of Al on occupation of lattice sites in the AlTi phase, 9: 1539(J)
effects of heat treatment on elevated-temperature tensile properties and microstructure, 9: 2719(R)
fabrication, heat treatment, and effect of microstructure on mechanical properties of, 9: 178
fabrication, mechanical properties, oxidation, and powder metallurgy, 9: 3520
hot-rolled textures and deformation mechanisms of, 9: 1836(R)
hydrogen equilibrium pressure and concentration in α-phase, 9: 2329(J)
mechanical properties of, effects of structure and composition on, 9: 201(J)
mechanical properties and microstructure of flash-welded, 9: 965
melting techniques and forging temperatures for preparation of, 9: 1850(R)
metallurgical properties, 9: 3475
microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296
nature of quench transformation in, 9: 1844(R)
phase studies, bend ductility, tensile properties, hardness, microstructures of as-rolled and heat-treated welded and unwelded, 9: 3493(R)
preparation by nonconsumable and consumable electrode arc melting, 9: 2293(R)
room-temperature dynamic elastic modulus and its ratio to density, 9: 2728(R)
strength, effects of temperature, 9: 2282
tensile, bend, and hardness properties of as-rolled and heat-treated welded and unwelded, 9: 3499(R)
tensile properties at room-temperature, effects of creep test conditions on, 9: 2275(R)
welding and mechanical properties, effect of alloying elements on, 9: 3854(R)

Titanium–aluminum–carbon systems
mechanical properties, 9: 3854(R)

Titanium–aluminum–carbon–vanadium systems
tensile properties, 9: 3853(R)

Titanium–aluminum–chromium alloys
effects of heat treatment on elevated-temperature tensile properties and microstructure, 9: 2719(R)
fabrication, 9: 1534(R)

Titanium–aluminum–chromium alloys (cont'd)
fabrication and physical properties, 9: 2717(R)
hardness, crystal structure, and phase studies, 9: 3520
hardness, heat treatment, and microstructure, 9: 4186
impact strength and hardness of weld thermal-cycled heat-affected zone of, 9: 1531
microstructure and continuous cooling transformation of, 9: 1531

Titanium–aluminum–chromium–iron–molybdenum alloys
preparation and properties, 9: 3490(R)

Titanium–aluminum–chromium–molybdenum alloys
phase structures and tensile properties of as-produced, 9: 2279(R)

Titanium–aluminum–chromium–nickel alloys
surface chemistry of oxidized, 9: 2747(J)

Titanium–aluminum compounds (intermetallic)
preparation of homogenous γ, 9: 3850(R)

Titanium–aluminum–indium alloys
hardness, crystal structure, and phase studies, 9: 3520

Titanium–aluminum–iron alloys
fabrication and physical properties, 9: 2717(R)
hardness, crystal structure, and phase studies, 9: 3520

Titanium–aluminum–manganese alloys
analysis of, for H, 9: 3077(J)
casting and mechanical properties of as-cast wrought, 9: 184
compression properties and microstructure, 9: 3475
fabrication, heat treatment, phase studies, mechanical properties, microstructure, and aging characteristics, 9: 1856(R)
hardness, crystal structure, and phase studies, 9: 3520
high-temperature tensile properties of annealed sheet and bar, 9: 3198(J)
machining and grinding, 9: 4174
mechanical properties and microstructure of flash-welded, 9: 964
phase studies and microstructure, 9: 1873(J)
transformation temperatures, age hardening, heat treatment, and mechanical properties, 9: 1534(R)

Titanium–aluminum–molybdenum alloys
creep and tensile properties of as-forged and heat-treated, effect of structure on, 9: 2279(R)
effects of heat treatment on elevated-temperature tensile properties and microstructure, 9: 2719(R)
hardness, crystal structure, and phase studies, 9: 3520
melting techniques and forging temperatures for preparation of, 9: 1850(R)

Titanium–aluminum–nickel alloys
hardness, crystal structure, and phase studies, 9: 3520
preparation, sintering, density, resistivity, percent O_2, stress rupture, and impact strength of hot-pressed, 9: 3165(R)
stress-ruptured of sintered, 9: 3850(R)

Titanium–aluminum–niobium alloys
oxidation, 9: 3849(R)

Titanium–aluminum–nitrogen systems
mechanical properties, 9: 3854(R)

Titanium–aluminum oxide systems
hardness and microstructure, 9: 2246
powder metallurgy, 9: 3496

Titanium–aluminum–oxygen systems
effects of heat treatment on elevated-temperature tensile properties and microstructure, 9: 2719(R)
mechanical properties, 9: 3854(R)

Titanium–aluminum–silicon systems

effects of heat treatment on elevated-temperature tensile properties and microstructure, 9: 2719(R)

hardness, crystal structure, and phase studies, 9: 3520

melting techniques and forging temperatures for preparation of, 9: 1850(R)

phase studies and hardness of, 9: 1843(R)

tensile properties of as-forged, 9: 2279(R)

transformation temperatures, age hardening, heat treatment, and mechanical properties, 9: 1534(R)

Titanium–aluminum–silver alloys

oxidation, 9: 3849(R)

Titanium–aluminum–tantalum alloys

hardness, crystal structure, and phase studies, 9: 3520

oxidation, 9: 3849(R)

Titanium–aluminum–tin alloys

hardness, crystal structure, and phase studies, 9: 3520

high-temperature tensile properties of annealed sheet and bar, 9: 3198(J)

spot welded joints in, 9: 1839(R)

Titanium–aluminum–tin–vanadium alloys

fabrication and physical properties, 9: 2717(R)

Titanium–aluminum–vanadium alloys

aging characteristics and tensile, bend, and hardness properties of as-rolled and heat treated welded and unwelded, 9: 3499(R)

effects of heat treatment on elevated-temperature tensile properties and microstructure, 9: 2719(R)

electroplating and tensile properties, 9: 3853(R)

fabrication, heat treatment, and effect of section size on mechanical properties, 9: 1534(R)

hardness, crystal structure, and phase studies, 9: 3520

hardness of, water quenched from 1000°C, 9: 1842(R)

melting techniques and forging temperatures for preparation of, 9: 1850(R)

partial isothermal sections of, at 800, 900, 1000, and 1200°C, 9: 1843(R)

phase studies, 9: 1844(R)

Titanium–aluminum–zirconium alloys

hardness, crystal structure, and phase studies, 9: 3520

impact testing, presintering and sintering and stress-rupture testing of sintered, 9: 3850(R)

Titanium arsenides

crystal structure and phase studies, 9: 3064(J)

Titanium–beryllium oxide systems

hardness and microstructure, 9: 2246

Titanium boride–chromium–molybdenum systems

refractory properties, 9: 4137(R)

Titanium borides

metallurgical properties, survey, 9: 3822(J)

preparation by vacuum technique, 9: 1821(J)

properties of, effect of molten Ti on, 9: 2248

Titanium carbide–nickel compacts

mechanical properties of, 9: 1820(R)

vibratory compacting, 9: 4173(R)

Titanium carbide–nickel systems

microstructure, effect of ball-milling, pressing, and sintering on, 9: 2756(J)

Titanium carbide systems

compression-creep properties, 9: 3504(R)

Titanium carbides

metallurgical evaluation of C, graphite, and Nb, Ta, W, Ti, V, and Zr carbide crucibles for molten, 9: 2247

Titanium carbides (cont'd)

metallurgical properties, survey, 9: 3822(J)

microstructure, 9: 2756(J)

powder metallurgy and properties, 9: 2703(R)

properties of, effect of molten Ti on, 9: 2247

purification of, by flotation of C, 9: 2703(R)

reaction of Th with, at high temperatures, 9: 1247

reactions of, with Fe, Ni, Mo, Si, Nb, Ti, and Zr at 1600° to 1900°C, 9: 3821(J)

Titanium–carbon–manganese systems

fabrication, heat treatment, phase studies, mechanical properties, microstructure, and aging characteristics, 9: 1856(R)

heat treatment, mechanical properties, microstructure, and phase studies, 9: 180(R)

phase studies and microstructure, 9: 1873(J)

Titanium–carbon–molybdenum systems

forging in inert gas, 9: 984(J)

grain growth and size, microstructure, phase studies, and tensile properties of heat-treated, 9: 975

Titanium–carbon–nickel systems

microstructure and phase studies, 9: 3457

Titanium–carbon–oxygen systems

mechanical properties, microstructure, and phase studies, 9: 1870(J)

Titanium–carbon–silicon systems

constitution diagrams, 9: 4187

Titanium–carbon systems

mechanical properties, microstructure, and phase studies, 9: 1870(J)

mechanical properties of welded, 9: 1859

microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296

phase studies, vacuum annealing, machinery, and combustion determination of C in, 9: 1859

preparation, double inert-gas arc melting, forging, and welding, 9: 3489(R)

preparation by nonconsumable and consumable electrode arc melting, 9: 2293(R)

room-temperature dynamic elastic modulus and its ratio to density, 9: 2728(R)

size of interstitial solute atoms, lattice expansion, and electronic properties of close-packed, 9: 1780(J)

Titanium chlorides

disproportionation and vapor pressure, 9: 2628(J)

enthalpy of formation, 9: 2292

heat of formation, 9: 1185(J)

heat of formation and entropy, 9: 2290

infrared spectroscopic determination of impurities in, 9: 920(J)

mass spectrum of $TiCl_4$, 9: 291(J)

mixtures with heptane, total pressure from 25 to 80°C, 9: 1751(J)

preparation of, by reduction of $TiCl_4$ with H, 9: 2630(J)

thermodynamic properties, 9: 2626(J)

Titanium–chromium alloys

effects of heat treatment on elevated-temperature tensile properties and microstructure, 9: 2719(R)

fabrication, 9: 2326(J)

grain-boundary diffusion in, as bonding agent between Ti and steel, 9: 4182

hardness and phase studies, 9: 1843(R)

hardness, heat treatment, and microstructure, 9: 4186

Titanium–chromium alloys (cont'd)

phase structure and tensile properties of as-forged and heat-treated, 9: 2279(R)

preparation, corrosion, physical properties, and testing, 9: 2740

tensile properties, 9: 3486(R)

x-ray density as a function of Cr and oxidation as a function of density and composition, 9: 3841(R)

Titanium–chromium alloy–chromium couples

diffusion coefficients, 9: 2739

Titanium–chromium compounds (intermetallic)

powder preparation, microstructure, and x-ray-diffraction patterns, 9: 3841(R)

Titanium–chromium couples

diffusion coefficients, 9: 2739

Titanium–chromium–iron alloys

creep of heat-treated and as-received, at 76 and 600°F, 9: 3478(R)

creep of hot-rolled and annealed, at 76 and 600°F aging effects on, 9: 3479(R)

creep of Ti 150A, 9: 168(R)

drilling tests, 9: 3544(J)

effects of creep testing on room-temperature tensile properties of heat-treated and hot-rolled, 9: 2279(R)

machining and grinding, 9: 4174

machining characteristics of forged Ti-150A, 9: 4168

tensile properties and rupture at 800°F of hot-rolled, 9: 2275(R)

tensile properties at room temperature, effects of creep test conditions on, 9: 2275(R)

Titanium–chromium–iron–manganese–molybdenum alloys

mechanical properties and microstructure of extruded and heat treated, effects of temperature, pressure, and die angle on, 9: 2276(R)

Titanium–chromium–iron–manganese–molybdenum–vanadium alloys

heat treatment, mechanical properties, phase studies, tensile properties, and welding, 9: 2298

tensile properties, hardness, and flash weldability, 9: 3856

Titanium–chromium–iron–molybdenum alloys

tensile properties and ductility, 9: 1848(R)

Titanium–chromium–manganese alloys

grain structure, hardness, heat treatment, mechanical properties, phase studies, and welding, 9: 2298

Titanium–chromium–manganese–molybdenum alloys

microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296

Titanium–chromium–molybdenum alloys

effects of grain size on the mechanical properties of, 9: 1837(R)

mechanical properties of, effects of grain size and heat treatment on, 9: 3492(R)

Titanium–chromium–nitrogen systems

electrical resistance of films of, 9: 2345(J)

Titanium–chromium–oxygen systems

phase studies, 9: 1874(J)

Titanium–chromium–vanadium alloys

constitution diagrams and mechanical properties, 9: 4187

hardness, heat treatment, mechanical properties, phase studies, and welding, 9: 2298

Titanium coatings

deposition on Cu, Fe, and carbon steel from pyrosols, 9: 2307(J)

preparation by electrodeposition, 9: 4183

Titanium–cobalt alloys

grain boundary diffusion in, as bonding agent between Ti and steel, 9: 4182

Titanium–cobalt compounds (intermetallic)

powder preparation, microstructure, and x-ray-diffraction patterns, 9: 3841(R)

Titanium conferences

on diffusion and mechanical properties of Ti, held at Columbia Univ. June 9 and 10, 1954, 9: 2284

on hydrogen embrittlement in α-β Ti alloys, 9: 3183

on materials and design for light-weight construction, 9: 1281(J)

on surface treatment of Ti held at Armour Research Foundation, Chicago, on Jan. 28, 1953, 9: 2283

Titanium–copper alloys

heat treatment, mechanical properties, and microstructure, 9: 1875(J)

preparation by nonconsumable and consumable electrode arc melting, 9: 2293(R)

room-temperature dynamic elastic modulus and its ratio to density, 9: 2728(R)

Titanium crystals

yield phenomena, kink bands, and geometric softening in, 9: 3187(J)

Titanium fluorides

x-ray diffraction analysis of TiF_3, TiF_4, and $TiOF_2$, 9: 3787(J)

Titanium–gadolinium oxide systems

hardness and microstructure, 9: 2246

Titanium–hydrogen–nitrogen systems

preparation and constitution diagrams, 9: 4187

Titanium–hydrogen systems

microstructure, 9: 1857

Titanium hydroxides

colloid suspensions, electrolyte effects on surface of, 9: 1193(J)

Titanium–iron alloys

electric resistance, phase studies, and microstructure of heat-treated, 9: 975

grain boundary diffusion in, as bonding agent between Ti and steel, 9: 4182

martensite formation and hardness in powders and lump specimens of, 9: 1547(J)

mechanical properties, effect of microstructure, 9: 4172

oxygen content and oxide phase equilibrium with, 9: 1546(J)

Titanium–iron–molybdenum alloys

hardness, heat treatment, mechanical properties, phase studies and welding, 9: 2298

Titanium–iron–oxygen systems

phase studies, 9: 1874(J)

Titanium–iron–vanadium alloys

fabrication and physical properties, 9: 2717(R)

microstructure, hardness, and tensile properties of welded and unwelded, 9: 3493(R)

Titanium isotopes

relative abundances of, from mass-spectrometric analysis of $TiCl_4$, 9: 291(J)

Titanium isotopes Ti^{47}

Coulomb excitation functions and energy levels for, bombarded with 3.5-Mev α particles, 9: 423(J)

Titanium isotopes Ti^{48}

deuteron reactions (d,p), angular distribution, 9: 2020(J)

Titanium isotopes Ti^{49}

ground and excited states of, from Ti^{48} (d,p) reaction, 9: 2020(J)

Titanium isotopes Ti^{51}

decay, 9: 1675(J), 3687(J)

decay schemes, 9: 988(R)

Titanium–lead alloys
preparation and phase studies, 9: 1872(J)
Titanium–magnesium alloys
constitution diagrams, 9: 2761(J)
heat treatment, 9: 3486(R)
Titanium–magnesium oxide systems
powder metallurgy, 9: 3496
Titanium–manganese alloys
analysis of, for H, 9: 3077(J)
casting and mechanical properties of as-cast and wrought, 9: 184
creep of heat-treated and as-received, at 76, 210, 400, and 600°F, 9: 3478(R)
creep of as-received and heat-treated, at 76, 210, 400, and 600°F, aging effects on, 9: 3479(R)
creep of RC-130A, 9: 168(R)
electric resistance, microstructure, phase studies, and impact and tensile properties of heat-treated, 9: 975
fabrication and mechanical properties, 9: 3858
hardness, heat treatment, and microstructure, 9: 4186
hardness and microstructures of welded RC-130A, 9: 3493(R)
heat treatment response, effect of α solutes on, 9: 1873(J)
high-temperature tensile properties of annealed sheet and bar, 9: 3198(J)
machining and grinding, 9: 4174
mechanical properties, effect of H on, 9: 1857
microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296
phase studies and physical properties, 9: 1528
phase studies, bend ductility, and tensile strength of welded and unwelded RC-130A, 9: 3493(R)
spot welded joints in, 9: 1839(R)
tensile properties, 9: 1848(R)
welding of RC-130A, effect of heat treatment and surface contamination on, 9: 227(J)
Titanium–manganese–nitrogen systems
fabrication, heat treatment, phase studies, mechanical properties, microstructure, and aging characteristics, 9: 1856(R)
phase studies and microstructure, 9: 1873(J)
Titanium–molybdenum alloys
creep and rupture behavior at 600 to 1000°F, 9: 3483
creep and tensile properties of as-forged, effect of structure on, 9: 2279(R)
creep-rupture strength of, 9: 633
effects of heat treatment on elevated-temperature tensile properties and microstructure, 9: 2719(R)
grain boundary diffusion in, as bonding agent between Ti and steel, 9: 4182
grain growth, effects of dispersed carbides, 9: 3486(R)
grain growth and size, microstructure, phase studies, and tensile properties of heat-treated, 9: 975
martensitic quench products and α' tempering, 9: 1843(R)
mechanical properties, effect of H on, 9: 1857
microstructure of heat-treated, 9: 2275(R)
phase studies and mechanical properties, 9: 1841(R)
plastic deformation and preferred orientation, 9: 1836(R)
preparation, microstructure, phase studies, heat treatment effects, and mechanical properties, 9: 2729(R)
tempering of α' phase in, 9: 1844(R)
tensile properties at room temperature, effects of creep test conditions on, 9: 2275(R)
Titanium–molybdenum–vanadium alloys
hardness, influence of cooling rate on, 9: 1842(R)
Titanium–molybdenum–vanadium alloys (cont'd)
phase studies, 9: 1844(R)
phase studies and hardness of, cooled by oil, water, and air, 9: 1843(R)
Titanium–nickel alloys
grain boundary diffusion in, as bonding agent between Ti and steel, 9: 4182
Titanium–nickel compounds (intermetallic)
powder preparation, microstructure, and x-ray-diffraction patterns, 9: 3841(R)
Titanium–niobium alloys
resistivity-temperature-concentration relationships of, 9: 1538(J)
Titanium nitrides
reactions of, with Fe, Ni, Mo, Si, Nb, Ti, and Zr at 1600° to 1800°C, 9: 3821(J)
vaporization and heat of formation of, 9: 2153(J)
Titanium–nitrogen systems
constitution diagrams, 9: 2339(J)
fabrication, heat treatment, and effect of microstructure on mechanical properties of, 9: 178
mechanical properties of, effects of structure and composition on, 9: 201(J)
microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296
preparation, double inert-gas arc melting, forging, and welding, 9: 3489(R)
size of interstitial solute atoms, lattice expansion, and electronic properties of close packed, 9: 1780(J)
Titanium oxide–aluminum oxide systems
thermal expansion, 9: 3844(R)
Titanium oxide–barium oxide systems
phase studies, crystal structure, heat treatment, and constitution diagrams, 9: 3142(J)
Titanium oxide–calcium oxide systems
fabrication, hydration, refractory properties and thermal expansion, 9: 945(R)
Titanium oxide–uranium oxide systems
phase studies, 9: 925
Titanium oxides
combined with oxides of Fe, Co, and Ni, preparation and fluorite structures, 9: 857(J)
dissociation and reduction by CO, 9: 4201
fabrication and dielectric properties for linear accelerator wave guides, 9: 1096
heat and free energy of formation, 9: 529(J)
physical properties of TiO, Ti_2O_3, Ti_3O_5, and TiO_2, 9: 3498(R)
thermal fracture under quasi-static thermal stresses, 9: 1506(J)
Titanium(IV) oxides
crystal structure, effect of method of preparation on, 9: 2619(J)
dielectric properties and solid-state reactions of, with binary, ternary, and quarternary systems of CaO, MgO, and SnO_2, 9: 3820(J)
Titanium oxyfluorides
structure, 9: 2190(J)
Titanium–oxygen–nickel systems
phase studies, 9: 1874(J)
Titanium–oxygen–phosphorus systems
metallic phases in, 9: 658(J)
Titanium–oxygen systems
constitution diagrams, 9: 2339(J)
creep deformation of, 9: 175(R)
evaporation rate of, 9: 2209(J)
fabrication, heat treatment, and effect of microstructure on mechanical properties of, 9: 178

Titanium–oxygen systems (cont'd)

isotopic equilibration determination of O in, 9: 3394

preparation, double inert-gas arc melting, forging, and welding, 9: 3489(R)

size of interstitial solute atoms, lattice expansion, and electronic properties of close-packed, 9: 1780(J)

vapor-solid equilibria in, 9: 2772(J)

silicon coating, negative results, 9: 3496

Titanium–stainless steel couples

electrochemical corrosion, 9: 1838(R)

Titanium sulfides

x-ray studies of, 9: 887(J)

Titanium–tantalum alloys

hot-rolled textures of, 9: 1836(R)

nature of quench transformation in, 9: 1844(R)

phase studies and physical properties, 9: 1528

Titanium–thorium alloys

surface hardening by nitridation, 9: 978(R)

Titanium–thorium oxide systems

hardness and microstructure, 9: 2246

Titanium–tin alloys

densities, melting points, and thermal and x-ray diffraction analyses of various phases in heat-treated, 9: 2281(R)

hydrogen equilibrium pressure and temperature in single phase, 9: 2329(J)

volumetric determination of Sn in, 9: 89(J)

Titanium–tungsten alloys

phase studies and physical properties, 9: 1528

Titanium–uranium alloys

phase studies by thermal, microscopic, and x-ray analysis from 0 to 30 at.% Ti, 9: 1543(J)

Titanium–vanadium alloys

notch sensitivity, 9: 1549(J)

preparation by nonconsumable and consumable electrode arc melting, 9: 2293(R)

retention of soft β in ice-brine quenching of, containing $\geq$ 15%, 9: 1841(R)

room-temperature dynamic elastic modulus and its ratio to density, 9: 2726(R)

x-ray diffraction analysis, hardness, thermal expansion, electric conductivity, phase studies and heat treatment, 9: 2763(J)

Titanium–zirconium alloys

fabrication, 9: 1530(R)

hot-rolled textures of, 9: 1836(R)

Titanium–zirconium couples

diffusion of Zr in, tracer study, 9: 630

Titanium–zirconium oxide systems

hardness and microstructure, 9: 2246

powder metallurgy, 9: 3496

Titration equipment

(See also Laboratory equipment; Remote-control equipment.)

automatic coulometric, design, 9: 2160

automatic thermometric, 9: 2331(R)

design of trigger circuit for automatic coulometric, 9: 101(J)

large volume cell for simultaneous titrations and conductometric analyses, design, 9: 4094

photometric, for spectrophotometer, 9: 4081(J)

Tobin Creek Area (Alaska)

monazite occurrence in, 9: 1523(J)

Todilto Formation (Ariz.)

geology, 9: 1828

Tofty Tin Belt District (Alaska)

mineralogy of, 9: 1523(J)

Toluene

radioinduced chlorination of, 9: 1550(R)

Toluene, trinitro-

detonation velocities of, 9: 3214

Toluenesulfonic acid, triphenylethyl esters

mechanism of Wagner-Meerwein rearrangement in, 9: 1755(J)

Too High No. 1 Open Pit (Colo.)

geology, 9: 1513

Totem Operation

fission products from, uptake by plants and animals, 9: 35(J)

Tower Shielding Facility

control rod calibration, 9: 750

Toxins

from Cl. botulinum and staphylococci, inactivation by γ radiation, 9: 474

Tracer techniques

(See also appropriate subheadings under the device, material or phenomena studied by tracer methods; see also Radioisotopes; Stable isotopes.)

industrial applications of radioisotopes, conference, 9: 3807(J)

using tritium and C^{14} in clinical studies, 9: 3748(R)

Tracer techniques (biology)

improvements for thyroid-uptake studies using I^{131}, 9: 1737(J)

in vivo determination of two isotopes simultaneously, 9: 3730(R)

theoretical and practical manual for biological students and research workers, 9: 510(J)

Tracer techniques (chemical engineering)

using europium isotopes to study flow through agitators of U pilot leach plant, 9: 2261

Tracer techniques (chemistry)

applied to study of interaction of hair fibers with aqueous solutions including dye baths, 9: 922

preparation of labeled compounds and results in biochemical studies, conference, 9: 3719(J)

review, 9: 3582(J)

synthesis with C isotopes, bibliography, 9: 1488

Tracer techniques (geology)

geologic dating by A^{40}/K^{40} ratio, 9: 3463(J)

influence of bound β decay on geologic age determinations, 9: 953(J)

Tracer techniques (medicine)

preparation of labeled compounds and results, conference, 9: 3719(J)

Tracer techniques (metallurgy)

effects of method of counting radiation on reproducibility of diffusion measurements, 9: 197(J)

Traceriab, Inc.

progress reports on chemical systems sensitive to radiation, 9: 2847(R), 2848(R)

progress reports on development of slow neutron survey equipment, 9: 3930(R), 3931(R)

progress reports on utilization of radioactive energy as a source of battery power, 9: 267(R), 268(R)

Trader Smith's Claim (Utah)

mineralogy, 9: 1829

Tradescantia

chromosome breakage in, with Ca deficiencies, 9: 3006(J)

effects of mixed radiation from nuclear explosions on, 9: 823(J)

microspores, radioinduced chromosome aberrations in, effect of linear energy transfer on, 9: 835(J)

Transformation temperatures
measurement of solution critical points, 9: 513
Transformers
heating, for use with Mg Th alloy at 1000°C, design, 9: 931
impulse, design and performance of, for condenser impulse welding, 9: 641
life of, in radiation detection instruments, 9: 1329(J)
Transistors
effects of radiation on voltage output, 9: 3208(R)
Transonic flow
(See also Subsonic flow; Supersonic flow.)
streamlines in, theory, 9: 1243(J)
Transplutonic elements
(See also specific elements.)
separation from Pu, design of equipment for, 9: 571(J)
separation of, from irradiated Pu, 9: 3098
Transuranic elements
(See also specific elements.)
chemical and physical properties, 9: 2683(J)
crystal chemistry of compounds of, 9: 2372(J)
Traps
(See also Filters; Vacuum systems.)
diffusional and circulating cold, testing, 9: 4179(R)
for radioactive and other boiling liquids, design, 9: 1779
Trauma
of skin, formation of new capillaries following, effects of x irradiation on, in mice, 9: 2561(J)
surgical, effects on survival following low-rate x irradiation in chicks, 9: 2547(R)
Trichinosis
effects of γ radiation in pork, 9: 493(J)
incorporation of amino acids by Trichinella larvae, 9: 2099(R)
Trifluoromethyl groups
heat of formation, 9: 1772(J)
Trillium
microsporogenesis in excised anthers of, grown on steril media, 9: 3718(J)
Trimethylamine
direct fluorination, 9: 890
Triose phosphates
chromatographic determination of glyceraldehyde-3-phosphate and dihydroxyacetone phosphate in a mixture, 9: 1764
Triphenylmethyl groups
reaction mechanisms with benzoyl peroxide, 9: 2331(R)
Tritium
binding energy, 9: 4273(J)
cosmic-ray produced, abundance and distribution in natural waters, 9: 1698
detection and concentration measurements in Geiger tubes, 9: 2864(J)
determination of, by isotopic gas analysis, 9: 2180(J)
deuteron reactions (d,n), use in comparing some methods for the absolute measurement of a fast neutron flux, 9: 3985(J)
mass ratio of D and, 9: 2097(J)
moisture penetration in coatings, determination by, 9: 2784(J)
nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)
production by 2.2-Bev protons on Fe and its relation to cosmic radiation, 9: 3651(J)
Tritium (cont'd)
production by deuteron bombardment, 9: 2920(J)
production by 2.2-bev protons on N and O, 9: 2922(J)
production in high-energy d-d collisions, comparison to He^3 production, 9: 1659(J)
proton reactions, energy levels of α particles from, 9: 741(J)
radiometric determination of, performance of a liquid scintillation counter, 9: 2136(R)
as a trace element in clinical studies, 9: 3748(R)
tissue distribution and toxicology of, in rats and man, 9: 12
Tritium compounds
preparation, 9: 2180(J)
Tritium halides
one-to-two millimeter wave spectra of TCl and TBr, 9: 4032(J)
Tritium hydrides
(See Hydrogen tritides.)
Tritium–hydrogen systems
preparation of standard samples for mass spectrographic analysis, 9: 3248
Tritium oxides
(See Water-t; Water-t_2.)
Tritons
angular distribution in (t,2p) reactions, 9: 3323(J)
binding energy, equivalent two-body method for, 9: 4336(J)
mesonic decay of excited, 9: 4220(J)
range-energy and energy-momentum relations, tables, 9: 402
range-energy relations in nuclear emulsions up to 10 Mev, 9: 4250(J)
ranges in materials, prediction, 9: 2928
Trypsin
effects of treatment with, on radiation-recovery factor in tissue homogenates of spleen and bone marrow, 9: 3370
Tryptophan
effects of dietary, on gene action in Drosophila, 9: 3371(J)
Tuba City Area (Ariz.)
mineralogy, 9: 1829
Tubes
(See also Pipes.)
heat transfer and effect of voids and Prandtl modulus in tube banks and beds, 9: 2692
metal, thermal gradient and internal pressure stresses in, 9: 3124(J)
for transferring liquid hydrogen, design, 9: 3089
vertical, closed at bottom, heat-transfer coefficients and temperature distribution in, measurement, 9: 1805
welding procedures for, in heat exchangers, 9: 216(J)
Tubutulik River Area (Alaska)
mineralogy and U distribution in, 9: 1523(J)
Tufts College
progress reports on preparation of metal hydrides, 9: 635(R)
Tumors
(See also Bone tumors; Brain tumors; Carcinomas.)
ascites, effects on vascular permeability, 9: 2547(R)
cell nuclei, effects of β radiation, 9: 2547(R)
diagnosis, ultrasonic equipment for, 9: 2541(J)
of eye, diagnosis of, by differential uptake of P^{32}, and radiosensitivity of mouse ascites, 9: 18
growth, effects of continuous irradiation on, 9: 3(R)
of eye, differential uptake of P^{32} in diagnosis, 9: 40(J)

Tumors (cont'd)
growth of, effects on incorporation of adenine into nucleic acids in mice, 9: 1449(J)
intracranial, therapy with injected radioactive gold colloids, 9: 1172(J)
malignant, of thyroid gland, uptake of I^{131} by, 9: 500(J)
malignant, radioresistance, 9: 3017(J)
malignant, serous effusions arising from, therapy with colloidal Au^{198}, 9: 3041(J)
malignant, of skin following radiation therapy, 9: 32(J)
pituitary, spontaneous and radioinduced in mice, 9: 2559(J)
radiation implant therapy, and localization of antitumor antibodies labeled with I^{131}, 9: 3748(R)
radioinduced, in Drosophila, 9: 3022(J)
radioinduced, effects of bone marrow injections on development of, in mice, 9: 2597(J)
radioinduced, in mice, 9: 2563(J)
radioinduced, in rats, 9: 17
radioinduced hemangioendotheliomas in mice, 9: 827(J)
radiosensitivity of, effects of vitamin C-free diet on, in laboratory animals and man, 9: 3043(J)
radiotherapy of, review, 9: 3044(J)
of skin, effects of inhalation of oxygen on x radiation therapy, 9: 2124(J)
of skin, induced by radioactive and chemical carcinogens in mice, 9: 2565(J)
spontaneous, in small laboratory animals, in literature survey, 9: 2545(J)
of thyroid, and metastasis from, localization by uptake of I^{131}, counting method, 9: 46(J)
transplantation of, into lung, 9: 2099(R)
uptake of I^{131} by malignant melanomas, effects of thyroidectomy, 9: 3028(J)
Tungsten
adsorption of O_2, H_2, and CO on evaporated films of, 9: 2159(J)
effects of radiation on electric conductivity of wires of, 9: 800(R)
electric conductivity, 9: 976
electron bremsstrahlung spectrum near 1 Mev, 9: 1307(J)
extension of Matthiessen's Rule to cold-worked, 9: 1536(J)
filament activation by Gd, 9: 2794
film-surface area of evaporated, measurement, 9: 3887(J)
gamma penetration, tables and graphs, 9: 2472
neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)
oxidation of, under conditions of linear temperature increase, 9: 182
physical properties for furnace design, review, 9: 1213
polishing and etching of metallographic specimens of, method for, 9: 1865(J)
positive ion yields from, by, electrostatic fields, 9: 988(R)
radiochemical determination, 9: 876
separation of, by anion exchange, 9: 912(J)
specific heat of, 9: 237(J)
spectrographic determination of, in ores and rocks, 9: 162
spectrographic determination in Ti and Ti alloys, 9: 639(R)
surface reactions, determined by field-emission microscopy, 9: 2741
Tungsten–aluminum compounds (intermetallic)
crystal structure, 9: 2373(J)
Tungsten borides
preparation by vacuum technique, 9: 1821(J)
Tungsten carbide–cobalt systems
resistance sintering under pressure, 9: 1878(J)
Tungsten carbide–cobalt systems (cont'd)
strength, composition, and grain size of sintered, 9: 2755(J)
Tungsten carbides
properties of, effect of molten Ti on, 9: 2247
Tungsten–chromium alloys
fabrication, 9: 2326(J)
Tungsten–chromium–cobalt–nickel alloys
preparation, fabrication, density, tensile properties, microstructure, hardness and temperature effects of aged and sintered X-40 compacts, 9: 3173
weldability of wrought, 9: 3530(J)
Tungsten–chromium–molybdenum–nickel alloys
compressive-stress-rupture properties of high temperature, 9: 3503(R)
Tungsten–cobalt–molybdenum–nickel alloys
compression-creep properties, 9: 3504(R)
Tungsten isotopes W^{180}
gamma spectra and half lives of isomers, 9: 736
Tungsten isotopes W^{182}
decay schemes, 9: 3338(J)
Tungsten isotopes W^{183}
decay schemes, 9: 3338(J)
energy levels and γ spectra, 9: 4333
Tungsten isotopes W^{185}
decay scheme, 9: 2965(J)
disintegration of, electromagnetic radiation from, 9: 1122(J)
Tungsten–molybdenum–thorium alloys
forging in inert gas, 9: 984(J)
Tungsten oxides
heat and free energy of formation, 9: 529(J)
Tungsten oxyfluorides
preparation, 9: 1426(P)
Tungsten–titanium alloys
phase studies and physical properties, 9: 1528
Turbidimeters
(See Nephelometers.)
Turbine blades
casting and forging high-temperature alloys for, 9: 3869
creep, rupture, and thermal shock tests on heat-resisting alloys low in Co and Nb for castable, 9: 1890(J)
design and fabrication of B_2 turbosupercharger buckets, 9: 3173
thermal-shock resistant properties of, fabricated from $MoSi_2$, 9: 1249
Turbines
closed cycle gas, cycle study for Submarine Advanced Reactor, 9: 3288

U

Ultrasonics
application of, to cancer diagnosis, 9: 2541(J)
bibliography of nondestructive testing by, 9: 2237
use in cleaning hot metallographic samples, 9: 567(J)
Ultraviolet radiation
biological effects, book, 9: 4046(J)
cytological effects of, on E. coli, 9: 2107, 2108
effects of, on chromosomes in tomato plants, 9: 1451(J)
specific activity determinations, 9: 3262(J)
Univ. of Calif., Radiation Lab.
progress reports on Physics Division, 9: 2890(R)

Uracil, 2-thio-
pathological effects of, in rats, 9: 4039(R)

Uraninites
age determinations on, by x-ray techniques, factors affecting, 9: 3839(J)
ages of, methods for calculating, 9: 1233(J)
classification and properties, 9: 1233(J)

Uranium
anodic oxidation, 9: 130(J)
attenuation of 190-Mev deuterons and 340-Mev protons, 9: 778
burnup in reactors, determination of, using a scintillation spectrometer, 9: 3264(J)
cathodic vacuum etching of, 9: 128
chemical analysis, review, 9: 4200(J)
chromatographic determination of, in soil samples, 9: 3404(J)
colorimetric analysis for micro-amounts of B, 9: 2163
colorimetric determination of, with NH_4SCN, 9: 1151(J)
cosmic abundance of, in chondritic meteorites, 9: 3065(J)
crystal structure of β, 9: 1209(J)
detection of, in Al by colorimetric spot tests, 9: 1196
determination and separation from Th by 2, 4-dichlorophenoxyacetic acid, 9: 3782(J)
determination of trace impurities in, by ion exchange techniques, 9: 884(J)
effects of small strains on electric conductivity of, 9: 2098
electrolytic polishing, apparatus for, 9: 2328(J)
electron micrographs of cathodic vacuum etched, 9: 128
exploration for, book, 9: 960(J)
extraction by TBP and TBP–Amsco, mechanism of, 9: 585
extraction of, from ore concentrates, 9: 3155(J)
extraction of, from U ores using carbonate solution, 9: 911(J)
films, preparation of thin, 9: 3945(J)
fission yields of Sm^{153}, Eu^{154}, Gd^{159}, and Tb^{161} from, 9: 1700(J)
fluorimetric and colorimetric microdetermination in rocks and minerals, 9: 134(J)
fluorimetric determination of, in H_2SO_4, 9: 1761
gamma penetration, tables and graphs, 9: 2472
gravimetric, titrimetric, spectrophotometric, and fluorophotometric determinations, ANL procedures for, 9: 4074
gravimetric determination of, as oxinate using complexone as masking agent, 9: 4113(J)
handbook on inorganic chemistry of, translated from Gmelin, 9: 926(J)
low-pressure H_2 solubility in, 9: 1797(J)
μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)
mines, ventilation of, 9: 496(J)
mining of, in South Africa, 9: 163(J)
natural fission rate of, radiochemical measurement, 9: 1148(J)
neutron absorption in bulk, 9: 3712(J)
neutron capture cross section, relative accuracy of Swing measurement, 9: 2473
neutron inelastic scattering, group theory, 9: 3963
neutron production in, from electron bombardment, 9: 3964
polarographic determination, 9: 3402(J)
polarographic determination of, in presence of Fe and Cu, supporting electrolytes for, 9: 1149(J)
polarographic determination in ores and process samples, effects of impurities and additives on, 9: 133(J)
polarographic determination in ores in ascorbic acid supporting electrolyte, 9: 1232(J)

Uranium (cont'd)
polarographic determination of, in presence of other ions, 9: 1150(J)
potentiometric determination of, in uranyl chloride solutions, 9: 2686(J)
precipitation of, from ore solutions by ammonium carbonate pressure leaching, 9: 4145(R)
preferred orientation in rolled sheets of, 9: 3000(J)
proton reactions (p,n), angular distributions and yields at 23 Mev, 9: 4290(J)
pseudo-binary phase sections between Laves phases in, 9: 3353(J)
radiometric determination, 9: 2634
radiometric determination of, in presence of Pu, 9: 1598
radiometric determination of, in radioactive ores, 9: 878
reaction with H, 9: 3118
recovery from monazite sands, 9: 592(J)
recovery from pitchblende digestion residues, 9: 601(J)
refining methods and production of reactor fuel rods from, 9: 3711(J)
resonance absorption in spheres, 9: 3713(J)
retention of, during oxidative ashing of carbonaceous shales, 9: 881
separation plants and procedures, 9: 590(J)
separation process and facilities at Harwell, 9: 591(J)
as shielding for burned-out reactor fuel elements, calculations, 9: 2984
solvent extraction of, from a uranyl nitrate solution in nitric acid with TBP, performance of a louvre-plate redistributor for large-diameter pulse columns in, 9: 588(J)
spallation-fission by high-energy protons, 9: 4343(J)
spectrophotometric determination of hexone in aqueous solutions of, 9: 533
spectrophotometric determination of microgram amounts in solutions, 9: 2633
superconductivity, at very low temperatures, 9: 4033(J)
thermal conductivity, 9: 1994(R)
thermal conductivity and resistivity, 9: 4034(J)
thermal conductivity and thermal expansion, 9: 1266
thermal conductivity at 70°C, 9: 1879(J)
three-quantum annihilation of positrons in, 9: 249(J)
volumetric determination in presence of Fe in poor ores, 9: 2228(J)
volumetric determination of, in complex minerals, 9: 542(J)
volumetric determination of hexavalent, 9: 4146

Uranium (Al clad)
detection of corrosion pits and metallic inclusions by colorimetric spot tests, 9: 1196

Uranium acid phosphates
preparation, x-ray diffraction analysis, and solubility in H_3PO_4 solutions at 25°C, 9: 129

Uranium alloys
spectrophotometric determination of Nb in, 9: 4074

Uranium–bismuth alloys (liquid)
corrosive effects on stainless steel, 9: 3285

Uranium–carbon sandstone deposits (Ind.)
occurrence in coal field, 9: 1515

Uranium–carbon sandstone deposits (Utah)
occurrence in Southern Utah, 9: 3466(J)

Uranium–carbon systems
thermal conductivity at 70°C, 9: 1879(J)

Uranium chelates
with 2,4-pentanedione, formation constants, enthalpy, and entropy, 9: 3390(J)
with 8-quinolinol and 5,7-dihalo derivatives, absorption spectra, 9: 131(J)

Uranium–chromium alloys
thermal conductivity at 70°C, 9: 1879(J)

Uranium–chromium systems

phase studies, 9: 2726

Uranium complexes

absorption spectra of, with β-diketones, 9: 135(J)

Uranium compounds

polarographic determination of, in presence of Fe and Cu, supporting electrolytes for, 9: 1149(J)

Uranium–copper sandstone deposits (Utah)

occurrence in White Canyon Area, 9: 1512

Uranium deposits (Ariz.)

occurrence, 9: 1828

Uranium deposits (Colo.)

occurrence, 9: 1829

Uranium deposits (Idaho)

occurrence, 9: 1520(J)

Uranium deposits (Kan.)

occurrence in Clancey Mining District, 9: 1518(J)

Uranium deposits (Mont.)

occurrence, 9: 1520(J)

Uranium deposits (Nev.)

occurrence in Austin area, 9: 1257

Uranium deposits (N. Mex.)

occurrence, 9: 1829

Uranium deposits (Utah)

occurrence, 9: 1829

Uranium deposits (Wyo.)

genesis and occurrence in Gas Hills area, 9: 1261(J)

occurrence in Mayoworth area, 9: 956(J)

Uranium(IV) fluoride–magnesium systems

thermal conductivity and thermal diffusion, 9: 1283

Uranium(IV) fluorides

fluorination of, in preparation of UF_6, reaction kinetics, 9: 3385

hydrated, preparation and properties, 9: 1210(J)

preparation, hydration, thermogravimetric analysis, x-ray diffraction analysis, precipitation from aqueous solution, and reactions with hydrogen fluoride and aqueous hydrofluoric acid, 9: 1210(J)

thermal capacity and magnetic entropy, 9: 1231

Uranium(VI) fluorides

preparation of, by fluorination of UF_4, reaction kinetics, 9: 3385

Uranium–gold alloys

phase studies of, by thermal, metallographic, and x-ray methods, 9: 1147(J)

Uranium hydride compacts

density of, 9: 600

Uranium hydrides

dissociation pressure and pyrophoricity of, over range from 300 to 625°C, 9: 600

Uranium iodides

specific heat and magnetic susceptibility at 2.61°K, 9: 1067(R)

Uranium(IV) ions

absorption spectra, 9: 3001(J)

hydrolysis of UO_2^{2+}, mathematical analysis, 9: 2620(J)

Uranium(VI) ions

reduction to U(IV) by $SnCl_2$ in HCl solutions, 9: 3804(J)

Uranium–iron–nickel alloys

pseudo-binary phase sections between Laves phases in, 9: 3353(J)

Uranium isotopes

chemical separation after proton irradiation of natural U, 9: 2673(J)

electrolytic separation of negative results, 9: 289

Uranium isotopes U^{230}

decay and low-lying states of spin 1– in, 9: 1633(J)

Uranium isotopes U^{233}

velocity fine structure of fission fragments, 9: 1365(J)

Uranium isotopes U^{235}

determination of, by radioactivation, 9: 2687(J)

fission and total cross sections for 22-Mev protons in, 9: 738(J)

fission cross section, ratio between boron cross section and, 9: 3002(J)

fission cross section of, variation with energy in low-energy region, 9: 1145(J)

fission of, short-period delay neutrons from, 9: 2919(J)

fission yield fine structure of, in mass region 99 to 106, 9: 670(J)

neutron absorption cross section of, 9: 1146(J)

neutron fission cross section from 0.01 to 0.4 ev, 9: 3355(J)

nuclear spin, 9: 4272(J)

thermal neutron fission of, absolute fission yield of Ba^{140} in, 9: 467(J)

thermal neutron fission yields of Sr^{90}, Y^{90}, and Y^{91} from, 9: 817

velocity fine structure of fission fragments, 9: 1365(J)

Uranium isotopes U^{238}

deuteron reactions (d,n), cross section, 9: 2015(J)

disintegration constant, 9: 4323(J)

fission and total cross sections for 22-Mev protons on, 9: 738(J)

fission cross section, ratio between boron cross section and, 9: 3002(J)

fission yield fine structure of, in mass region 99 to 106, 9: 670(J)

neutron absorption cross section of, 9: 1146(J)

thermal neutron activation cross sections, 9: 3970(J)

Uranium leach residues

nitric acid, U recovery from, 9: 601(J)

Uranium leach solutions (carbonate)

uranium recovery from, 9: 911(J)

Uranium–manganese–nickel alloys

pseudo-binary phase sections between Laves phases in, 9: 3353(J)

Uranium minerals

(See also specific minerals by name; see also Uranium ores.)

age determination by Pb isotopic ratios, 9: 2712(J)

correlation chart of, 9: 954(J)

fluorometric and colorimetric microdetermination of U in, 9: 134(J)

glossary and chemical classification of, 9: 3465(J)

Uranium minerals (Nev.)

occurrence, 9: 1260(J)

Uranium–nickel alloys

preparation and properties, 9: 1431(P)

Uranium–niobium alloys

determination of Sn and Zr in ternary, 9: 4074

Uranium ores

(See also Uranium minerals.)

acid pressure leaching of, containing sulfidic minerals, 9: 3156(J)

acid pugging and curing of, 9: 4146

amenability tests of, by ammonium carbonate leaching, 9: 4145(R)

ammonium carbonate leaching, 9: 4145(R)

carbonate leaching, 9: 911(J)

classification, 9: 2711(J)

electronic concentration of low grade, with Lapointe picker, 9: 2242

extraction of U from, in Norway, 9: 3155(J)

flotation methods for, 9: 1432(P)

fluorimetric and colorimetric microdetermination of U in, 9: 134(J)

Uranium ores (cont'd)
leach pilot plant for, tracer techniques for study of flow through agitators of, 9: 2261
leaching of, review, 9: 3162(J)
oxidation state of, of Colorado Plateaus, relation of thermodynamic relations among V oxides to, 9: 1474(J)
polarographic determination of U in, effect of impurities and additives on, 9: 133(J)
radiometric analysis of, for U, 9: 878
volumetric determination of U in presence of Fe in poor, 9: 2228(J)
Uranium oxide–calcium oxide systems
oxidation of, phase diagrams, 9: 1796(J)
Uranium(IV) oxide compacts
thermal expansion of sintered, 9: 1699
Uranium oxide–magnesium oxide systems
oxidation of, phase diagrams, 9: 1796(J)
phase studies, 9: 925
Uranium(IV) oxide–neodymium oxide systems
phase studies, 9: 925
Uranium(IV) oxide–phosphoric acid systems
phase studies, 9: 129
Uranium oxide powders
thermal conductivity of, in gases and gas mixtures between 200° and 1500°F, 9: 4342
Uranium(VI) oxide–sodium oxide–water systems
equilibrium phase relations in, 9: 58
Uranium oxide–thorium oxide systems
chemisorption of O_2 on, 9: 603(J)
oxidation of, phase diagrams, 9: 1796(J)
preparation, crystal structure, phase studies, density, and oxidation, 9: 602(J)
Uranium oxide–yttrium oxide systems
oxidation of, phase diagrams, 9: 1796(J)
Uranium oxide–zirconium oxide systems
x-ray diffraction patterns, 9: 127
Uranium oxides
equilibriums of, between UO_2 and U_3O_8, 9: 1795(J)
phase studies, of between UO_2 and U_3O_8, 9: 1794(J)
phase studies and crystal structure of $UO_{2.5}$ to U_3O_8, 9: 2685(J)
Uranium(IV) oxides
chemisorption of O_2 on, 9: 603(J)
fluorination with hydrogen fluoride and aqueous hydrofluoric acid, 9: 1210(J)
oxidation of, kinetics and mechanisms of, 9: 1796(J)
production of reactor fuel rods from, 9: 3711(J)
thermal expansion, 9: 1266
Uranium(IV-VI) oxides
dusts of, relation of particle size to toxicity following inhalation by animals, 9: 1731(J)
production of, from ores in Norway, 9: 3155(J)
Uranium reserves
occurrence in Idaho, Utah, and Wyoming, 9: 2263
Uranium(IV) salts
electrophoresis, 9: 2684(J)
Uranium–silicon systems
determination of Si in, 9: 4074
Uranium–sodium fluoride systems
preparation, 9: 927(J)
Uranium sulfides
composition at various temperatures, 9: 3119(J)
physical properties of U_2S_5 and U_2S_3, 9: 3352(J)
Uranium–titanium alloys
phase studies by thermal, microscopic, and x-ray analysis from 0 to 30 at.% Ti, 9: 1543(J)
Uranium–vanadium sandstone deposits (Ariz.)
occurrence in Defiance Uplift, 9: 1628
Uranium–vanadium sandstone deposits (Colo.)
occurrence in Uravan District, 9: 2266(J)
Uranium–vanadium sandstone deposits (Utah)
occurrence in Polar Mesa, 9: 160
Uranium–vanadium sandstone deposits (Wyo.)
occurrence in Pumpkin Buttes Area, 9: 627(J)
Uranium–zirconium alloys
explosive properties of, during dissolution, etching, and pickling in nitric acid and HCl–ethyl acetate solutions, 9: 127
microstructure, phase studies, and x-ray diffraction patterns, 9: 127
phase studies, 9: 3354(J)
thermal conductivity at 70°C, 9: 1879(J)
Uranocircites
genesis and occurrence of, 9: 3158(J)
Uranyl carbonates
crystal structure, 9: 3437(J)
Uranyl chlorides
colorimetric analysis for micro-amounts of B, 9: 2163
potentiometric reduction of, with $CrCl_2$, 9: 2686(J)
structure of dilute aqueous solutions of, thermochemical investigation, 9: 132(J)
Uranyl chromate–water systems
phase studies and melting point, 9: 3384
Uranyl chromates
preparation, 9: 3384
Uranyl compounds
crystal chemistry, 9: 2372(J)
Uranyl ions
determination of, involving chelation with ethylenediaminetetraacetic acid, 9: 3436(J)
electronic structure and magnetic properties, 9: 4035(J)
equilibrium formation constants for reaction in aqueous solution of acetylacetonate ion with, 9: 1752(J)
hydrolysis, 9: 3438(J)
photochemical reactions, 9: 928(J)
separation by ion exchange, 9: 910(J)
Uranyl nitrate–butyl phosphate–nitric acid systems
uranium solvent extraction from, performance of a louvre-plate redistributor for large-diameter pulse columns in, 9: 588(J)
Uranyl nitrates
structure of dilute aqueous solutions of, thermochemical investigation, 9: 132(J)
Uranyl sulfate–water systems
viscosity of 0.176 to 2.865 molal, from 20 to 90°C, 9: 1490
Uravan District (Colo.)
geology, geophysical exploration for U–V occurrence in, 9: 2266(J)
Urea
synthesis by radiation of ammonia, methyl chloride, and m-phenylenediamine in methanal, 9: 4109(J)

Urea, thio-
protective effects against x radiation in mice, 9: 3034(J)

Urine
amino acid and corticosteroids in, effects of exposure to total-body irradiation, 9: 2566(J)
colorimetric analysis of, for fluorides, 9: 4076
determination of B in, 9: 53
determination of desoxyribonucleases in, following exposure to total-body irradiation in rats, 9: 23(J)
rat, separation of Ac^{227} from, 9: 2671

Utah
exploration of Henry Mountains Area in Wayne and Garfield counties, 9: 3466(J)
exploration of Kaiparowits Plateau Area in Garfield and Kane counties, 9: 3466(J)
exploration of Kolob Terrace Area in Kane, Washington, Garfield, and Iron counties, 9: 3466(J)
mineral association in U deposits, 9: 1829

Utah (Emery Co.)
photogeologic map of Emery Quadrangle in, 9: 3833(J)
photogeologic map of Tidwell Quadrangle in, 9: 3159(J), 3834(J)
photogeologic map of Woodside Quadrangle in, 9: 3831(J)
occurrence of rabbittites in, 9: 3829(J)

Utah (Garfield Co.)
photogeologic map of Carlisle Quadrangle in, 9: 2269(J)
photogeologic map of Circle Cliffs Quadrangle in, 9: 4147(J), 4148(J), 4149(J)
photogeologic map of Desert Lakes Quadrangle in, 9: 2270(J)
photogeologic map of Kaiparowits Peak Quadrangle in, 9: 3469(J)

Utah (Grand Co.)
exploration of Moab–Dewey Bridge Area in, 9: 1256
geophysical exploration of Polar mesa in, 9: 160
stratigraphy of Yellow Cat Area in, 9: 2262(R)

Utah (Kane Co.)
photogeologic map of Straight Cliffs Quadrangle in, 9: 3468(J)

Utah (San Juan Co.)
exploration of Wray Mesa in, 9: 1513
geology of Blanding District in, 9: 2262(R)
geophysical exploration of White Canyon Area in, 9: 1512
photogeologic map of Carlisle Quadrangle in, 9: 2269(J), 3832(J)
photogeologic map of Desert Lakes Quadrangle in, 9: 2270(J)
photogeologic map of Elk Ridge Quadrangle in, 9: 3467(J)

V

V particles
(See also S particles.)
decay of charged, 9: 324(J)
disintegration, 9: 2808
mass of, and decay products, calculation, 9: 331(J)
nature of, similarity to $\tau^{\pm}$ mesons, 9: 334(J)
production by interaction of 1.37-Bev π mesons with protons, 9: 4257(J)
production of neutral, by Cosmotron neutrons, 9: 3270(J)
production of pairs of, orientation of planes in, 9: 1989(J)
review of, in Annual Review of Nuclear Science, 9: 3957(J)

Vacuum
dielectric properties, 9: 1368

Vacuum furnaces
design of, 9: 989(R)
development and operation of high-temperature quenching, 9: 930(J)
laboratory, design and specifications, 9: 3420

Vacuum gages
(See also Pressure gages.)
design, 9: 1579(R)
ionization, electrometer circuit, 9: 4210(R)
recording Langmuir viscosity type, 9: 1025(J)
ultra-high, multicircuit control for, 9: 282(J)

Vacuum fusion analysis
apparatus for, of gases in metals, 9: 3406(J)

Vacuum pumps
(See also Jet pumps.)
control circuits for, design, 9: 3243(J)
design, 9: 1427(P)
design and performance of absorption, using Ba as absorbing medium, 9: 1368

Vacuum seals
design of demountable flangeless, 9: 691(J)
electron diffraction camera specimen chamber, 9: 690(J)

Vacuum systems
adsorbed water in, elimination of, by means of methychlorosilane, 9: 944(J)
electron diffraction camera specimen chamber, 9: 690(J)
for handling reactive and nonreactive gases, 9: 546
manual for, in electromagnetic separation plant, 9: 145

Vacuum techniques
manual for, in electromagnetic separation plant, 9: 145

Vacuum valves
all-glass, for obtaining ultra-high vacuum, 9: 146(J)
design, performance, and testing of pressure-vacuum diaphragm, 9: 3818
seal-off, design, 9: 614(J)
simplified construction of, 9: 1499(J)

Vacuum vessels
design of large, 9: 144

Valves
cast iron, for molten Al, 9: 191
cylinder, stress corrosion cracking of Al bronze bonnets on, 9: 3148(J)
design, 9: 1428(P)
design of electromagnetic, for Wilson cloud chamber, 9: 1612(J)
liquid metal, cleaning with ammonia, 9: 4175(R)
for liquid metals, testing, 9: 4179(R)
nickel diffusion leaks for regulating purified supply of H_2, 9: 3440(J)
testing in liquid metals, 9: 4175(R)

Van de Graaff accelerators
four million volt, design and performance, 9: 1368
pulsed ion source design, 9: 3666(J)
voltage surges and breakdown conditions, 9: 2467(J)

Vanadium
intermetallic compound with Sn, preparation and structure, 9: 3878(J)
iodometric determination, 9: 3072(J)
magnetic susceptibility at liquid He temperatures, measurement, 9: 4209
neutron-diffraction studies of superconducting state, 9: 3218(J)

Vanadium (cont'd)
preparation of, by reduction of V_2O_3, 9: 4181
production of, by bomb reduction of V_2O_5 with Ca, 9: 983(J)
spectrographic determination of, in ores and rocks, 9: 162
spectrographic determination in Ti and Ti alloys, 9: 639(R)
spectrophotometric determination of, with Na vanadate, 9: 86(J)
structure of carbide phases of, 9: 1866(J)
x-ray spectra (soft), 9: 452(J)
Vanadium alloys
oxidation, phase studies, and mechanical properties, 9: 3516(R)
oxidation and mechanical properties, 9: 3517(R)
Vanadium–aluminum–carbon–titanium systems
tensile properties, 9: 3853(R)
Vanadium–aluminum–tin–titanium alloys
fabrication and physical properties, 9: 2717(R)
Vanadium–aluminum–titanium alloys
aging characteristics and tensile, bend, and hardness properties of as-rolled and heat treated welded and unwelded, 9: 3499(R)
effects of heat treatment on elevated-temperature tensile properties and microstructure, 9: 2719(R)
electroplating and tensile properties, 9: 3853(R)
fabrication, heat treatment, and effect of section size on mechanical properties, 9: 1534
hardness, crystal structure, and phase studies, 9: 3520
hardness of, water quenched from 1000°C, 9: 1842(R)
melting techniques and forging temperatures for preparation of, 9: 1850(R)
partial isothermal sections of, at 800, 900, 1000, and 1200°C, 9: 1843(R)
phase studies, 9: 1844(R)
Vanadium borides
preparation by vacuum technique, 9: 1821(J)
Vanadium carbides
properties of, effect of molten Ti on, 9: 2247
Vanadium–chromium–iron–manganese–molybdenum–titanium alloys
heat treatment, mechanical properties, phase studies, tensile properties and welding, 9: 2298
tensile properties, hardness, and flash weldability, 9: 3856
Vanadium–chromium–titanium alloys
constitution diagrams and mechanical properties, 9: 4187
hardness, heat treatment, mechanical properties, phase studies, and welding, 9: 2298
Vanadium hydroxides
free energy change for formation from constituent ions, 9: 1474(J)
Vanadium(II) ions
free energy of formation and oxidational potential, 9: 1474(J)
Vanadium(III) ions
free energy of formation and oxidational potential, 9: 1474(J)
Vanadium–iron–titanium alloys
fabrication and physical properties, 9: 2717(R)
microstructure, hardness, and tensile properties of welded and unwelded, 9: 3493(R)
Vanadium isotopes
Allard-Chalmers concentration, 9: 1959(J)
Vanadium isotopes V^{47}
gamma spectra from deuteron bombardment, 9: 734
positron half life, determination of, 9: 1685
Vanadium isotopes V^{48}
capture-positron branching ratios, 9: 1674(J)
Vanadium isotopes V^{49}
K-capture decay, 9: 2061(J)
Vanadium isotopes V^{51}
Coulomb excitation functions and energy levels for, bombarded with 3.5-Mev α particles, 9: 423(J)
energy levels, 9: 2331(R)
Vanadium–molybdenum alloys
creep-rupture strength of, 9: 633
forging in inert gas, 9: 984(J)
Vanadium–molybdenum–titanium alloys
phase studies, 9: 1844(R)
phase studies and hardness of, cooled by oil, water, and air, 9: 1843(R)
Vanadium oxides
bomb reduction of, with Ca for production of V, 9: 983(J)
calcium reduction to V, 9: 4181
chemical stability in water solution at 25°C as functions of pH and oxidation potential, 9: 1474(J)
heat and free energy of formation, 9: 529(J)
phase relations at temperatures 650 to 1000°C, 9: 1468(J)
Vanadium(V) oxides
x-ray powder diffraction patterns and solubility in $HClO_4$–NH_4ClO_4 solutions, 9: 60
Vanadium–titanium alloys
notch sensitivity, 9: 1549(J)
preparation by nonconsumable and consumable electrode arc melting, 9: 2293(R)
retention of soft β in ice-brine quenching of, containing ≥ 15%, 9: 1841(R)
room-temperature dynamic elastic modulus and its ratio to density, 9: 2728(R)
x-ray diffraction analysis, hardness, thermal expansion, electric conductivity, phase studies and heat treatment, 9: 2763(J)
Vanadium–titanium–molybdenum alloys
hardness, influence of cooling rate on, 9: 1842(R)
Vanadium–uranium sandstone deposits (Ariz.)
occurrence in Defiance Uplift, 9: 828
Vanadium–uranium sandstone deposits (Colo.)
occurrence in Uravan District, 9: 2266(J)
Vanadium–uranium sandstone deposits (Utah)
occurrence in Polar Mesa, 9: 160
Vanadium–uranium sandstone deposits (Wyo.)
occurrence in Pumpkin Buttes Area, 9: 627(J)
Vanadium Wedge Mine (Nev.)
exploration, 9: 1260(J)
Vanadyl ions
absorption spectra and thermodynamic functions in $HClO_4$ solution at 25° 9: 60
Vapor pressure
measurement by tracer technique in solids, 9: 1188(J)
of metals, determination with radioisotopes, 9: 1883(J)
of sodium and potassium chloride solutions in light and heavy water, apparatus for determination of, 9: 524(J)
Ventilation
effectiveness of lignin paper filters in removal of dust and microorganisms from air of inhabited rooms, 9: 3361(J)
Vespidae
effects of delayed oviposition on x-ray-induced sterility in Habrobracon, 9: 3736(J)
effects of high-tension oxygen on pupa of Habrobracon, 9: 1729(J)
Victoreen Instrument Co.
progress reports on current regulator tube reliability, 9: 3546
Vinyl compounds
explosive properties of polyvinyl nitrates, 9: 1747(J)

Vinyl fluoride

(See Ethylene, fluoro-.)

Virgin Valley Opal District (Nev.)

geology and U distribution, 9: 1260(J)

Viruses

(See also Influenza virus.)

effects of radiation on poliomyelitis, 9: 491(J)

of poliomyelitis, radioinduced inactivation, 9: 3737(J)

Viscometers

design and performance of, for fluid measurement at elevated temperature, 9: 2332

design of, for measurement of viscosities of binary gas mixtures, 9: 3213

Viscosity

measurement at high temperatures, 9: 2822

Vita-Var Corp.

progress reports on development of a coating and pretreatment for metals, 9: 947(R)

Vitamin B_{12}

labeled with Co^{58}, preparation and use in tracer studies, 9: 1177(J)

retention of Co^{60} in, 9: 2104(J)

Vitamin C

(See also Ascorbic acid.)

exclusion from diet, effects on radiosensitivity of tumors in laboratory animals and man, 9: 3043(J)

Vitamin P

chemical properties and physiological effects, 9: 3388(J)

effects of therapy with, on radiation injuries in cancer patients, 9: 839(J)

Vitamins

effects of ionizing radiations on essential, in aqueous media, 9: 106

effects of radiation on, review of literature, 9: 2549

Voltage regulators

(See also Power supplies.)

degenerative circuit, for 10 to 100 kv, 9: 1949(J)

Volumetric analysis

high-frequency titrations of divalent metals using ethylenediaminetetraacetic acid, 9: 2169(J)

neutralization titrations in anhydrous formic acid, 9: 523(J)

reductometric titrations in glacial acetic acid, 9: 536(J)

titrations in glacial acetic acid based on formation of insoluble salts, 9: 535(J)

W

Wasatch Formation (Wyo.)

geology and U distribution, 9: 627(J)

Wasps

(See Vespidae.)

Waste disposal

(See also Sewage; Stack disposal; Waste processing.)

by fission-product adsorption on montmorillonite, 9: 929(J)

following adsorption on montmorillonite clay, 9: 1234

liquid, at Brookhaven, summary of data, 9: 2099(R)

of materials containing α and β particles, by dilution, 9: 4049

radioactive, in ocean, techniques for, 9: 1246(J)

in sea, methods of packaging, 9: 2099(R)

vapor compression evaporation, at BNL, 9: 2701(J)

Waste processing

(Treatment of radioactive wastes prior to disposal; see also appropriate subheadings under specific materials; see also Waste disposal.)

by adsorption on montmorillonite clay, 9: 1234

efficiency, application of sequential factorial designs to studies of, 9: 1235

by electromigration through ion exchange membranes, 9: 1500(J)

of high-activity aqueous waste streams, performance of continuous calciner, 9: 3120(R)

by ion exchange, review, 9: 3106(J)

using cation exchange materials, 9: 1501(J)

Waste solutions

design of proportional sampler for, 9: 2656(J)

Water

(See also Ground waters; Ice; Rain water; Sea water; Steam.)

absorption of x radiation by, 9: 2038(J)

analysis, review, 9: 4082(J)

attenuation of neutrons by, 9: 774

boiling, maximum and minimum values of heat transmitted from metal surfaces to, under atmospheric pressure, 9: 3129(J)

boiling burnout measurements, 9: 4131

chemical reactions with liquid metals, 9: 4179(R)

content in seed, effect on radiosensitivity, 9: 483(J)

corrosion of Al–Tin–Zn, Al–Si–Zn, Mg–Sn, Sn–Zn, Sn, and Al–Zn-soldered Al joints in 95°C, low-conductivity, aerated, distilled, 9: 2725

corrosion of Al, Zn, steel, and Zn–stainless steel and Al–stainless steel couples by, inhibition with Na dichromate–chloramine mixtures, 9: 153

corrosion of stainless steel and Si bronze auxiliary boilers and component parts by chlorinated and alkalized and pure deionized, 9: 3168

corrosive effects of, at high temperatures, 9: 3459

corrosive effects of, on brass, bronze and cast Fe, 9: 3148(J)

corrosive effects of high-temperature, on reactor structural materials, descaling methods, 9: 154

corrosive effects on Al, studied by radioactive tracers, 9: 2257(J)

corrosive effects on Al soldered joints, 9: 193(J)

corrosive effects on cold-worked and annealed Al, 9: 2252

corrosive effects on Fe, texture of γ-$Fe_2O_3 \cdot H_2O$ crystals from, 9: 886

corrosive effects on various structural materials at 600 and 680°F, 9: 1822

effect on the vapor tension and calorimetry of 100% and aqueous solutions of nitric acid, 9: 2140(J)

electron-induced decomposition, relation to mass spectrometric C_3^+ measurement in graphite vapor, 9: 105(J)

equation of state, 9: 987

evaporation rate of, pressures and rates of, 9: 937

explosions of molten Al, Mg, and KCl–NaCl with, prevention of, 9: 176

films and vapor, stopping of α particles by, 9: 3311(J)

fresh, abundance of O^{18} in, 9: 1952(J)

gamma attenuation, 9: 2983

gamma penetration, tables and graphs, 9: 2472

heat and free energy of formation, 9: 529(J)

heat transfer during boiling of, 9: 1238(J)

heat transfer to boiling, forced through a uniformly heated tube, 9: 186

hydrolysis of alkyl halides and sulfonium salts by, and D_2O, 9: 2646(J)

infrared spectrometric determination of D_2O in, 9: 94(J)

isotopic reactions with HD, 9: 861(J)

micro analysis for D, vapor-tension method, 9: 2645(J), 3780

molecular structure, theory, 9: 231(R)

Water (cont'd)

neutron attenuation measurements at high energies, 9: 4004(J)

neutron distribution in, from a fast neutron source, 9: 411(J)

neutron flux distribution in, at In resonance energy, 9: 1107

neutron-proton coincidences from γ bombardment, 9: 1066(R)

penetration and diffusion of γ radiation in, 9: 3677(J)

photo-oxidation of, by ceric ion, mechanism of, 9: 2669

radiation chemistry, elementary processes in, 9: 104(J)

radioinduced decomposition of, yields of H_2O_2, effects of KCl and KBr, 9: 2660(J)

self-diffusion coefficients of, in aqueous ovalbumin solutions, tracer study, 9: 1229(J)

self-diffusion of, in protein solutions, theory, 9: 1187(J)

slowing down of Ra-α-Be neutrons, 9: 1105

softening of, by ion exchange, review, 9: 3106(J)

solubility of air in, instrument for, 9: 3068

solubility of hydrogen in, enrichment of D_2 in, 9: 2405

solution with dioxane, determination of pKd values and stability constants of, 9: 869(J)

thermal neutron diffusion parameters, 9: 1387(J)

thermodynamic functions of, to 12,000°K, 9: 1896

vapor pressure and separation factor for mixture of D_2O and, 9: 545(J)

vapor pressure lowering of, by addition of NaCl and KCl, 9: 524(J)

Water-d

neutron attenuation measurements at high energies, 9: 4004(J)

Water-d_2

electrolytic dissociation of, electrodes, cells, materials and apparatus for measurement of, 9: 3078(J)

enrichment by fractional distillation, 9: 3785

exchange between clay minerals and, 9: 2648(J)

hydrolysis of alkyl halides and sulfonium salts by, and H_2O, 9: 2646(J)

infrared spectrometric determination in water, 9: 94(J)

neutron-proton coincidences from γ bombardment, 9: 1066(R)

physical properties of, from room temperature to 250°C, 9: 2181(J)

separation of boric acid from, by ion exchange, 9: 3097

transport mean free path of thermal neutrons at 13°C, 9: 2476(J)

vapor pressure, 9: 545(J)

vapor pressure and separation factor for mixture of water and, 9: 545(J)

Water-d_2–boric acid systems

separation of boric acid from, by ion exchange, 9: 3097

Water-t

formation and relative abundance in atmosphere, 9: 126(J)

Water-t_2

preparation of a primary standard of, for use in determination of tritium content of water samples, 9: 1697

tissue distribution and toxicology of, in rats and man, 9: 12

Water Boiler Neutron Source

production of short-lived isotopes in, 9: 1953(J)

Water–boron oxide–lithium oxide systems

phase studies, 9: 4073(J)

Water–1-butanol systems

mass transfer in a horizontal liquid-liquid extraction tube, properties affecting the film coefficients of, 9: 2208

Water–2-butanone systems

mass transfer in a horizontal liquid-liquid extraction tube, properties affecting the film coefficients of, 9: 2208

Water–cadmium chloride–zinc chloride systems

activity coefficients at 25°C, 9: 3795(R)

Water–cyclohexanol systems

mass transfer in a horizontal liquid-liquid extraction tube, properties affecting the film coefficients, 9: 2208

Water–2-furaldehyde systems

mass transfer in a horizontal liquid-liquid extraction tube, properties affecting the film coefficients of, 9: 2208

Water–hydrogen sulfide systems

effects of, on electrode potentials and corrosion of Zn, Fe, Al, Ag, Pb, Sn, Ni, Cu, Mg, Avial, steel, and brass, 9: 4143(J)

Water–methane, nitro- systems

mass transfer in a horizontal liquid-liquid extraction tube, properties affecting the film coefficients of, 9: 2208

Water–methanol systems

decomposition of, by Co^{60} gamma radiation, formaldehyde and ethylene glycol yields from, 9: 2203(J)

Water moderated reactors

(See also specific water moderated reactors.)

control rod effectiveness, theory, 9: 4285

design and cost factors of swimming pool type, 9: 751(J)

Water purification equipment

effectiveness of ion-exchange materials in removal of chemical warfare agents, 9: 914

Water–silver nitrate–sodium nitrate systems

activity coefficients at 25°C, 9: 3795(R)

Water–sodium chloride systems

corrosion effects, 9: 3459

Water–sodium oxide–uranium(VI) oxide systems

equilibrium phase relations in, 9: 58

Water–steam systems

deposition of salts and temperature distribution in steam-generating pipes, 9: 3449(J)

Water supplies

concentration of radium and thorium in wells of the Chicago and Frankfurt am Main, Germany, areas, 9: 3231(J)

Water–uranyl chromate systems

phase studies and melting point, 9: 3384

Water–uranyl sulfate systems

viscosity of 0.176 to 2.865 molal, from 20 to 90°C, 9: 1490

Water vapor

(See also Steam.)

reaction of, with Zn, D_2 isotope effects, 9: 73(J)

thermal conductometric determination of low concentrations of, in gases, instrument for, 9: 99

Water–zirconium systems

drying and explosive limits, 9: 1853

Wave mechanics

(See also Mathematics; Physics.)

many parameter wave functions in the independent particle model, 9: 1695(J)

Schrödinger equation for helium atom, a more accurate solution of, 9: 1419(J)

self mass of photons by, 9: 1143(J)

theory of nuclear shells, 9: 1640(J)

Welding

(See also appropriate subheadings under specific materials; see also Brazing.)

of aluminum sheet by oxy-acetylene process, 9: 221(J)

arc, process adjustment in inter-gas-shielded, 9: 211(J)

condenser impulse, design of equipment, materials, energy considerations, and uses of, 9: 641

design and testing of remotely controlled device for joining stainless steel tubes by heliarc, 9: 631

Welding (cont'd)
equipment for, 9: 2737
equipment for, design and performance, 9: 1859
equipment for argon-arc, of stainless steel pipes, 9: 3514, 3515
hard-facing alloy steels with electric arcs, control measures in, 9: 220(J)
of heat exchangers, procedures, 9: 632
heliarc, in N atmosphere, NO_2 formation during, 9: 629
inert-gas, prevention of current rectification and high frequency interference in, 9: 212(J)
literature survey on cracking in, 9: 1532
of molybdenum, design and performance of equipment for, 9: 974
operating characteristic of different waterproofing coatings on electrodes in underwater metallic arc, 9: 2316(J)
multi-arc, electrical aspects of, 9: 3167
procedures for, tubes in heat exchangers, 9: 216(J)
resistance, electronic controls, 9: 2833(J)
sigma, principles of and suitable power supply for, 9: 210(J)
techniques for, heavy sections, 9: 222(J)
of 30-ft-diam. steel test tank, 9: 228(J)
of type 347 stainless steels, qualification tests on modified type 347 stainless steel electrodes for, 9: 2734
Welds
of copper–nickel alloy with stainless steel, thermal rupture, 9: 1264
crack sensitivity of, in light alloys, effects of separation stresses, form of separation of intermediate phases, shrinkage cavities, and unusual shrinking stresses on, 9: 196
cracking tests on filler-wire and base-metal compositions of steel, 9: 3494(R)
effect of current, voltage, and speed travel on, in Cr steels, 9: 218(J)
fatigue of spot-welded joints in Ti, 9: 1849(R)
fatigue tests of, in Ti alloys, stainless steel, and Al alloy, 9: 3500
gamma radiography, 9: 1819(J)
high-strength filler metals for welding steels, testing, 9: 3497(R)
mechanical properties of, in unalloyed Ti, 9: 215(J)
in molybdenum, ductility, 9: 633
radiographic analysis, 9: 1279(J)
in stainless steel, mechanical properties of, 9: 1860
in stainless steel, testing, 9: 3864
in stainless steel (austenitic) and AMS 6415 low-alloy steel, mechanical properties, 9: 1840
strength of, calculation of by an empirically determined limit curve, 9: 217(J)
strength and toughness of, in unalloyed Ti, improvement of, 9: 225(J)
tensile properties of, in Al alloys, 9: 3508
tensile properties of arc-deposited C steel, effect of temperature on, 9: 223(J)
tensile testing of, in Mg–Zr alloys, 9: 2737
titanium alloy in Ti, mechanical properties and phase structure, 9: 2299
of titanium alloys, fatigue behavior, 9: 3491(R)
titanium and titanium in alloys, fatigue behavior and testing, 9: 1839(R)
in titanium–Mn sheet alloy RC-130A, effects of heat treatment and surface contamination on, 9: 227(J)
titanium spot, tensile properties, 9: 224(J)
West Willys Claim (Nev.)
uranium distribution and geology, 9: 1260(J)
West Willys Group (Nev.)
exploration, geology, mineralogy, and U distribution, 9: 1516(J)
White Canyon Area (Utah)
geophysical exploration, 9: 1512
White Canyon Area (Utah) (cont'd)
mineralogy, 9: 1829
White Oak Creek
ecology and radiobiological monitoring, 9: 1445
White River Badlands (S. Dak.)
exploration, geology, and U distribution, 9: 3158(J)
White River Formation (Wyo.)
geology, 9: 627(J)
Whitewood Limestone (S. Dak.)
geology of, 9: 165(J)
Wind River District (Wyo.)
exploration, 9: 1514(R)
Wind River Formation (Wyo.)
uranium distribution and exploration, 9: 1261(J)
Windows
shielding glasses and liquids for protective, 9: 2519(J)
thin glass, preparation and properties, 9: 649
Windy Claims (Calif.)
geology, 9: 3837(J)
Wisconsin Univ.
progress reports on LiF thermoluminescent dosimeters, 9: 2412(R)
Woodside Quadrangle (Utah)
photogeologic map of, 9: 3831(J)
Wounds
healing, effects of total-body irradiation on, in mice, 9: 487(J)
Wray Mesa (Colo.-Utah)
exploration, 9: 1513
Wyoming
exploration of Gas Hills Area in Fremont and Natrona counties, 9: 1261
exploration of Pumpkin Buttes Area in Campbell and Johnson counties, 9: 627
Wyoming (Johnson Co.)
exploration of Mayoworth Area in, 9: 956(J)
Wyoming (Sweetwater Co.)
uranium bearing coal in Red Desert Area in, 9: 2263

X

X radiation
(See also Gamma radiation; Photons.)
absolute yield of Fe^{3+} from 200 kv, on $FeSO_4$, 9: 108(J)
absorption of, by tissue and water, 9: 2038(J)
anemia and blood-platelet changes following total-body exposure to, in rats, 9: 2119(J)
bacteremia following total-body exposure to, relationship to indigenous intestinal flora in rats, 9: 2115(J)
from betatrons, therapeutic applications, 9: 1724(J)
biochemical effects of, on tissues, 9: 2548(R)
biological effectiveness of high and low intensity, on Drosophila, 9: 3029(J)
biological effects of, compared with effects of α particles, in mice, 9: 2564(J)
biological effects of, compared with effects of α particles on yeast, 9: 3364
biological effects of, on microörganisms and mouse spleen, 9: 1723(R)

X radiation (cont'd)

biological effects of 80-kv, compared with 250 kv, in mice, 9: 3(R)

broad-beam 70- to 250-kvp, attenuation by Al and concrete, 9: 2046(J)

calibration of diagnostic beams, 9: 3374(J)

carcinogenicity of whole-body, in rats, 9: 17

chromosome breakage and rejoining capacity following exposure to, in Trillium, 9: 1154

chromosome breakage following exposure to, in Tradescantia, 9: 2576(J)

conductivity induced in polyethylene terephthalate by, 9: 4013(J)

congential malformations from exposure to, a statistical analysis of offspring of radiologists, 9: 3025(J)

critical-absorption and emission energies of elements in kev, table, 9: 3227(J)

detection and measurement, efficiency of standard free-air ionization chambers, 9: 1331(J)

detection and measurement of, over a wide band of energies, performance of a photographic film detector, 9: 1318

direct and indirect effects of exposure to, on growth and histochemistry of adrenal autotransplants in rats, 9: 22(J)

dosage determinations of, for rabbits, 9: 3(R)

dosage determinations of, from continued and fractional exposure in mice, 9: 2555(J)

dosage determinations of, to walls of radiographic rooms, 9: 2047(J)

dosimetry of, using photographic film detectors, 9: 2428(J)

effects of a single dose of 135 to 285 r of, on blood picture in man, 9: 3012(J)

effects of continuous and periodically interrupted, on grains and rabbits, comparison, 9: 27(J)

effects of cumulative doses of, on learning and retention in monkeys, 9: 2109

effects of doses of, between 1,000 and 25,000 r, on guinea pigs, 9: 1168(J)

effects of exposure of radiosensitive organs and tissues to, on development of radiation sickness, 9: 3018(J)

effects of exposure of skin to, on diffusion of fluids, 9: 3742(J)

effects of exposure to, in producing skin erythema, 9: 1158(J)

effects of exposure to, on adenosine triphosphatase activity in tissue homogenates, 9: 2587(J)

effects of exposure to, on barley seed, 9: 3369(J)

effects of exposure to, on bristles of Drosophila, 9: 2585(J)

effects of exposure to, on chromosomes in Drosophila, 9: 3021(J), 3023(J)

effects of exposure to, on chromosomes in grasshopper neuroblasts, 9: 2575(J)

effects of exposure to, on cytoplasm of Habrobracon eggs, 9: 2573(J)

effects of exposure to, on desoxyribonuclease activity of blood plasma in rats, 9: 2579(J)

effects of exposure to, on development of eggs of Habrobracon, 9: 3024(J)

effects of exposure to, on division rate and survival of Tillina and Colpoda, 9: 2584

effects of exposure to, on E. coli, influence of low temperature on recovery, 9: 2562(J)

effects of exposure to, on lethality, atrophy of small intestine, and Fe^{59} uptake by red blood cells in rats, 9: 1711

effects of exposure to, on nucleic acid content of thymic cells in mice, 9: 2558(J)

effects of exposure to, on Paramecium, 9: 3014(J)

effects of exposure to, on resorption rate of injected $NaHCO_3$ in rats, tracer study, 9: 3732(J)

effects of exposure to, on survival and cleavage in Ascaris eggs, effects of temperature, 9: 2571(J)

effects of exposure to, on uptake of Fe by bone-marrow cells, tracer study, 9: 3011(J)

X radiation (cont'd)

effects of exposure to, on velocity of conduction in isolated nerves of frogs and rabbits, 9: 2582(J)

effects of high dosage, on success of skin grafting in mice, 9: 2560(J)

effects of local exposure to, on formation of new capillaries in skin following trauma, 9: 2561(J)

effects of, on chromosomes in tomato plants, 9: 1451(J)

effects of, on electrolyte retention in muscle, 9: 3032(J)

effects of, on incorporation of formate into nucleic acid components in rats, tracer study, 9: 1176

effects of, on growth of tissue cultures, compared with effects of electrons, 9: 3016(J)

effects of, on metabolism in chick embryos, tracer study, 9: 3376

effects of, on metabolism in eggs and embryos of grasshoppers, 9: 495(J)

effects of, on nucleic acid content of carcinoma cell suspensions, 9: 1718(J)

effects of, on ovaries of mice, 9: 2557(J)

effects of, on phagocytosis and bactericidal power of blood, 9: 2577(J), 2578(J)

effects of, on serum protein in rats having a benzopyrene-induced tumor, 9: 31(J)

effects of, on the hypothalamus in primates, 9: 833(J)

effects of, on viscosity of alginates, 9: 2658(J)

effects of total-body exposure to, compared with effects of, 9: 3013(J)

effects of total-body exposure to, in urinary excretion of desoxyribonucleases in rats, 9: 23(J)

effects of whole-body exposure to, on a natural inhibitor of carboxypeptidase in mice, rats, and rabbits, 9: 3728

effects of total-body exposure to, on acetylation of sulfanilamide in rats and guinea pigs, 9: 3729

effects of total-body exposure to, on adrenal cortical activity in rats, 9: 3365

effects of whole-body exposure to, on biochemical activity in spleen of rats, 9: 3738(J)

effects of total-body exposure to, on body fluid compartments in human subjects, 9: 3031(J)

effects of total-body exposure to, on concentrations of oxidized and reduced diphosphopyridine nucleotide in rat liver, 9: 3740(J)

effects of total-body exposure to, on desoxyribonuclease activity of spleen in rats, 9: 488(J)

effects of total-body exposure to, on enzyme activity in hematopoietic tissue, in mice and rats, 9: 14

effects of total-body exposure to, on enzyme systems of liver and spleen in rats, 9: 2120(J)

effects of whole-body exposure to, on erythropoiesis in dogs and rats, 9: 3739(J)

effects of total-body exposure to, on functional activity of coenzyme A, 9: 2574(J)

effects of total-body exposure to, on healing of wounds in mice, 9: 487(J)

effects of total-body exposure to, on levels of nucleic acids and other biochemical constituents in rat tissue, 9: 480(R)

effects of total-body exposure to, on lipoprotein metabolism in rabbits, 9: 1446

effects of total-body exposure to, on lipoprotein metabolism in rabbits, dogs, rats, and mice, 9: 3009

effects of total-body exposure to, on liver mass in rats, 9: 1447

effects of total-body exposure to, on memory of monkeys, 9: 478, 479

effects of total-body exposure to, on metabolism and on adenosine triphosphatase and 6-nucleotidase activity of hematopoietic system in rats, 9: 480(R)

effects of total-body exposure to, on metabolism of benzoic acid in rats, 9: 486(J)

effects of total-body exposure to, on metabolism of sulfanilamide and phenolic compounds by guinea pigs and rats, 9: 480(R)

X radiation (cont'd)

effects of total-body exposure to, on nitrogen excretion in rats, 9: 2568(J)

effects of total-body exposure to, on uptake of iron by duck erythrocytes, 9: 2580(J)

effects of total-body exposure to, on weight of mice, 9: 477

effects of whole-body exposure to, on phospholipid synthesis and lipid distribution in rats, 9: 1161(J)

effects of total-body exposure to, on pyrophosphatase and adenosine-triphosphatase activity of spleen and thymus in rats and renal function in chickens, 9: 3(R)

effects of total-body exposure to, on response to analgesic drugs, in rats, 9: 13

effects of varied doses of, on chromosomes in Tradescantia, 9: 3020(J)

effects of whole-body exposure to, on uptake of Fe by erythrocytes in ducks, 9: 1155

effects of whole- and of partial-body exposure to, on tissue distribution of Fe in young rats, tracer study, 9: 3050(J)

effects on cell division in amoeba, 9: 2112(J)

effects on central nervous system from local exposure to, 9: 2588(J)

effects on chromosomal aberrations and rejoining in Trillium, 9: 476

effects on conduction velocity of isolated nerves in bullfrogs, 9: 3727

effects on development of embryos of frogs, 9: 820

effects on incorporation of adenine into nucleic acids in mice, 9: 1449(J)

effects on infectivity and hemagglutination properties of influenza virus, 9: 2106

effects on metabolism of radioactive glutathione in mice, 9: 15

effects on seed, influence of sea-water content on, 9: 483(J)

effects on sterol metabolism in yeasts, 9: 1170(J)

effects on the reaction between formic acid and cerium(IV) ions in aqueous solution, 9: 3792(J)

escape peak correction of iodine K, for NaI crystals, 9: 312(J)

from a four-million-volt Van de Graaff accelerator, radiographic characteristics, 9: 1368

genetic and non genetic effects of, on Neurospora, 9: 475

genetic effects of, compared with effects of fast neutrons in Drosophila, 9: 824(J)

genetic effects of, in Drosophila, 9: 30(J)

genetic effects of, in fungi, 9: 29(J)

high-energy, integral dose measurement in betatron radiation therapy, 9: 2878(J)

high-intensity, measurement of, 9: 1604(J)

inactivation of yeast by exposure to, effects of hydrostatic pressure on, 9: 1167(J)

induced exchange of Ce(III)–Ce(IV) in aqueous HNO_3 and H_2SO_4 acids by, 9: 2668(J)

induced sterility in Habrobracon from, effects of delayed oviposition on, 9: 3736(J)

induction of chromosome aberrations by, analysis of, 9: 3027(J)

induction of emesis by total-body exposure to, in dogs, 9: 16

induction of mutations following exposure to, effects of wave-length on, in Drosophila, 9: 3731

ionization current ratios of, instrument for measuring, 9: 2419(J)

lethal effects, mechanism of, 9: 18

lethal effects, modifications by tissue homogenates and chemicals in mice and rats, 9: 2595(J)

low-energy depth-dosage determinations, 9: 2547(R)

oxidation and reduction of ceric salts by, 9: 1215(J)

oxidation and reduction of cerous-ceric system by, role of oxygen radicals in, 9: 1214(J)

X radiation (cont'd)

oxygen effect in exposures of bacteria and yeast to, role of respiration and cellular metabolism in, 9: 24(J)

pathological effects and lethal dosage determination of, for chick embryos, 9: 822(J)

pathological effects of, on developing teeth in rats, 9: 484(J)

pathological effects of, on gonads of mice, 9: 2554(J)

pathological effects of, on nerve cells in brain of primates, 9: 831(J)

pathological effects of, on newborn mice, 9: 2556(J)

pathological effects of total-body exposure to, effects of diet on, in rats, 9: 2569(J)

pathological effects of total-body exposure to, on kidneys in chickens, 9: 3(R)

photonuclear reactions with Cu, Zn, Ga, Ge, and As, interpretation of results, 9: 3654(J)

photonuclear reactions with Cu, Zn, Ga, Ge, and As, yields from, 9: 3653(J)

physiological effects of, as demonstrated by effects on growth and mutations in barley, 9: 1159(J)

physiological and histochemical effects of total-body exposure to, in connective tissue in rats, 9: 492(J)

probability distribution of intensities in molecules, 9: 2494(J)

production by β excitation, 9: 2950

production of cataracts by exposure to, mechanism of, in rabbits, 9: 494(J)

production of melanotic tumors and erupt eyes by exposure to, in Drosophila, 9: 3022(J)

protective effects of thiourea and thyroxine against exposure to, in mice, 9: 3034(J)

relative biological effectiveness of, in mammalian systems, compared with effects of other radiations, 9: 3007

small angle scattering by surface irregularities, 9: 3675(J)

spatial distribution of energy dissipation by high-energy, calculation, 9: 422(J)

spray, effects on survival times of patients with chronic leukemia, 9: 3037(J)

synergistic effects of total-body exposure to, with blast effects on mice, 9: 3744(J)

therapy, skin cancer following, 9: 32(J)

therapy of skin tumors with, effects of inhalation of oxygen, 9: 2124(J)

therapy with, changes in blood picture during, 9: 3038(J)

tolerance to anoxia following total-body exposure to, in guinea pigs, 9: 2110

toxin production following exposure to, in rats, 9: 2099(R)

transmission of, through human body, 9: 3039(J)

tumors following exposure to, in mice, 9: 827(J)

wave numbers of Kα satellites in, from Z = 19 to 42, 9: 4341(J)

X-ray beams

high-energy, dosimetry, 9: 2879(J)

pulsed, measurement of distortion in magnet cloud chambers with, 9: 3596(J)

spectral dose rate distribution of, from a Be window tube operated at 50 kvp, 9: 2334

X-ray cameras

for diffraction studies at low temperatures, design, 9: 2835(J)

X-ray-diffraction analysis

design and performance of a tungsten-coil furnace for high-temperature of phase changes and equilibria, 9: 2319(J)

equipment for, of metals under controlled stress at elevated temperature, 9: 277(J)

equipment for, performance, 9: 3408

focusing camera for, 9: 4227

X-ray-diffraction analysis (cont'd)
scintillation counting applied to, 9: 313(J)
textbook on, 9: 1931(J)
X-ray diffractometers
design and performance, 9: 1309(J)
X-ray equipment
automatic exposure controller for roentgenographic examination, design, 9: 1456
compact demountable diffraction tube and associated equipment, design, 9: 2389(J)
design of gas-target tubes, 9: 1133
portable field, design and performance, 9: 2826
X-ray sources
beta-ray excited low energy, 9: 3333(J)
preparation from β-excited nuclides, 9: 2950
X-ray spectra
isotope shift in, of heavy elements, 9: 1414
X-ray spectrometers
adapter for, for study of large single crystals, design and performance, 9: 2831
adjustable bilateral slit for use with photomultiplier in, 9: 2398(J)
curved-crystal, microanalysis and simultaneous analysis by, applications in, 9: 3435(J)
photographic and Geiger-counter techniques, comparison, 9: 1945
relation between x-ray line and resolving power of double-crystal, 9: 686(J)
resolving power of bent-crystal, 9: 285(J)
single crystal temperature-controlled oven for, 9: 1028(J)
small-angle, design and performance, 9: 800(R)
X-ray spectroscopy
resolving power of a bent crystal spectrograph, 9: 285(J)
Xanthates
solubility products, 9: 623(R), 3111(R)
Xenon
ionization yields, 9: 999(J)
virial coefficients, from 0° to 700°C, 9: 3573(J)
Xenon isotopes
nuclear properties, 9: 735
Xenon isotopes Xe^{125}
nuclear properties, 9: 735
Xenon isotopes Xe^{127}
decay scheme, 9: 2968(J)
nuclear properties, 9: 735
Xenon isotopes Xe^{131}
gamma emission from, intensity relationship of, 9: 1684
Xenon isotopes Xe^{135}
decay schemes, measurements and interpretation, 9: 3332(J)
Xenon isotopes Xe^{138}
decay schemes, measurements and interpretation, 9: 3332(J)

Y

Yeasts
growth and cell division of, chemical inhibition, 9: 1461(J)
oxygen effect in x-irradiated, role of respiration and cellular metabolism in, 9: 24(J)
reproduction of, effects of physical and chemical environment and exposure to x radiation, 9: 1712
Yeasts (cont'd)
sterol metabolism in x-irradiated, 9: 1170(J)
x-ray inactivation of, effects of hydrostatic pressure on, 9: 1167(J)
Yellow Cat Area (Utah)
stratigraphy, 9: 2262(R)
Yerington Property (Nev.)
exploration, 9: 1260(J)
Yip Yip Mine (Colo.)
uranium and V distribution, 9: 1513
Ytterbium
chelation with thenoyltrifluoroacetone, 9: 924(J)
hyperfine structure, 9: 2525(J)
radioactivity, 9: 4274(J)
tissue distribution of, in rats, tracer study, 9: 2551(R)
Ytterbium chlorides
crystal structure, 9: 544(J)
Ytterbium isotopes Yb^{175}
gamma emission, 9: 2136(R)
Yttrium
determination by Cu-spark spectroscopy, 9: 885(J)
radiochemical determination, 9: 876, 2634
spectrographic determination of, in ores and rocks, 9: 162
spectrum of, in 9400 to 11,500 A region, 9: 2988(J)
tissue distribution of, following intracavitary administration to normal and tumor-bearing mice and cancer patients, tracer study, 9: 511(J)
tissue distribution of, in experimental animals, tracer study, 9: 1725(J)
Yttrium chlorides
crystal structure, 9: 544(J)
tissue distribution and excretion of, after intraprostatic injection in dogs, tracer study, 9: 3378(J)
Yttrium compounds
with cyclopentadiene, 9: 3096(J)
Yttrium isotopes Y^{85}
gamma spectra and half life, 9: 734
Yttrium isotopes Y^{86}
gamma spectrum and decay scheme of, 9: 1069
Yttrium isotopes Y^{88}
decay schemes and half lives, 9: 61(R)
isomeric state of, in decay of Zr^{88}, 9: 3684(J)
Yttrium isotopes Y^{89}
deuteron reactions (d,p), proton angular distributions from, 9: 763(J)
Yttrium isotopes Y^{90}
colloids of, preparation and tissue distribution in animals, 9: 1459(J)
gamma emission, 9: 1407(J)
half life, 9: 2004(J), 2399
preparation of carrier-free, 9: 2399
thermal neutron fission yields from U^{235}, 9: 817
uniform clay spheres, manufacture, 9: 2099(R)
Yttrium isotopes Y^{91}
decay, 9: 4324(J)
Yttrium isotopes Y^{92}
decay schemes and half lives, 9: 2948
Yttrium nitrates
preparation of anhydrous, by reaction of oxides and NO_2, 9: 1283(J)
solvent partition of, between nitric acid and tributyl phosphate, 9: 901

Yttrium oxide–uranium oxide systems

oxidation of, phase diagrams, 9: 1796(J)

thermal neutron fission yields from U^{235}, 9: 817

Yttrium oxides

separation and preparation by ion exchange, 9: 1788(J)

Z

Zeolites

(See Anion exchange materials; Cation exchange materials; Ion exchange materials.)

ZEPHYR

design, power-level measurement, shielding and operational safety, core assembly, and delayed neutrons and kinetics, 9: 753(J)

neutron flux variation with number of fuel elements present, 9: 2445

operational features of, 9: 1083(J)

Zinc

adsorption of O_2 on evaporated films of, 9: 2159(J)

bremsstrahlung reactions at 320 Mev, interpretation of results, 9: 3654(J)

bremsstrahlung reactions at 320 Mev, nuclide yields from, 9: 3653(J)

corrosion of, and stainless steel–Zn couples by water, inhibition with Na dichromate-chloramine mixtures, 9: 153

cross sections for neutron transmission and multiplication, 9: 3646(J)

diffusion of, in Ag–Zn alloys with admixtures of Au, Ga, Sn, Sb, Al, and In, 9: 3875

electroforming from fluoborate, sulfate–chloride, chloride, and cyanide baths, 9: 3495

electrolytic deposition of, effect of fluorine in, 9: 891(J)

galling and seizing of, by friction coefficients, 9: 1269

gamma reactions (γ,n), 9: 1358(J)

ion exchange on Dowex 50 at 25°C, 9: 3795(R)

liquid-liquid extraction from Co, 9: 1224(J)

μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)

neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)

pressure-compression data for, from shock wave measurements, 9: 3876(J)

quantitative determination of divalent, using a high-frequency oscillator and ethylenediaminetetraacetic acid, 9: 2169(J)

radiometric determination, 9: 2634

reaction of, with water vapor, D_2 isotope effects, 9: 73(J)

solid-solubility curve of, in Cd, 9: 2770(J)

spectrographic determination in Bi, 9: 1475

surface diffusion, coefficients of, 9: 3845(R)

thermodynamic properties of, in Al–Zn alloy, 9: 972(R)

wetting by liquid Na, 9: 229(J)

x-ray spectra (soft), 9: 452(J)

Zinc (liquid)

vapor pressure from 554 to 904.2°C, 9: 1883(J)

Zinc alloys

corrosion testing, methods for cleaning exposed specimens for, 9: 952(J)

room- and elevated-temperature mechanical properties and heat treatment, 9: 3840(R)

Zinc–aluminum alloys

corrosion of, in 95°C, low-conductivity, aerated, distilled water, 9: 2725

creep of, grain-boundary movement, slip, and fragmentation during, 9: 2321(J)

Zinc–aluminum alloys (cont'd)

intercrystalline grains in, growth of, determined by the method of microhardness, 9: 642(J)

thermodynamic properties, 9: 972(R)

Zinc–aluminum–copper alloys

spiral substructures in β phase, 9: 1881(J), 1882(J)

Zinc–aluminum–magnesium alloys

stress corrosion of, due to $MgZn_2$, 9: 4143(J)

Zinc–aluminum–silicon systems

corrosion of, in 95°C, low-conductivity, aerated, distilled water, 9: 2725

Zinc–beryllium–cobalt–copper alloys

mechanical properties, 9: 3509

Zinc–calcium compounds (intermetallic)

crystal structure, 9: 683(J)

Zinc chelates

with 2,4-pentanedione, formation constants, enthalpy, and entropy, 9: 3390(J)

Zinc chloride–cadmium chloride–water systems

activity coefficients at 25°C, 9: 3795(R)

Zinc coatings

spraying of, on iron and steel for corrosion prevention, 9: 3150(J)

on steel, corrosion and weldability of, 9: 171

Zinc complexes

with o-phenanthroline and sulfonated oxine, electrodeposition from aqueous solutions of, electronic configuration in, 9: 2625(J)

Zinc–copper alloys

relaxation effects in solid solutions of, arising from changes in local order, 9: 204(J)

relaxation strength, 9: 1537(J)

Zinc crystals

cleaved, photoelectric work function, 9: 4266(R)

effects of impurities and imperfections on the creep and hardness of, 9: 970

effects of the structure of dislocation boundaries on yield strength of, 9: 183

Zinc fluorides

crystal structure, 9: 92(J)

Zinc(II) ions

thermodynamic formation constants in aqueous solution for reaction of, with acetylacetonate at 30°C, 9: 1191(J)

Zinc isotopes

electromagnetic concentration of stable, 9: 1312

Szilard-Chalmers concentration, 9: 1959(J)

Zinc isotopes Zn^{65}

capture-positron branching ratios, 9: 1674(J)

determination of, in animal tissues, 9: 3379(J)

gamma emission, energy measurement by secondary electron absorption, 9: 809(J)

toxicology of, for cattle, 9: 1156(R)

Zinc isotopes Zn^{67}

Coulomb excitation functions and energy levels for, bombarded with 3.5-Mev α particles, 9: 423(J)

Zinc isotopes Zn^{69}

deuteron reactions (d,p), 9: 1397(J)

Zinc isotopes Zn^{69}

disintegration, 9: 2972(J)

energy levels, 9: 1397(J)

Zinc isotopes Zn^{71}
disintegration, 9: 2972(J)
Zinc–lanthanum compounds (intermetallic)
crystal structure, 9: 683(J)
Zinc–lithium–magnesium alloys
phase relations in, 9: 3166
Zinc minerals
adsorption of thiols on, 9: 166(J)
Zinc oxides
heat and free energy of formation, 9: 529(J)
Zinc–silver alloys
diffusion of Zn in, with admixtures of Au, Ga, Sn, Sb, Al, and In, 9: 3875
Zinc sulfides
doubly activated phosphors of, effects of infrared radiation on, 9: 431(J)
scintillation by α particles, 9: 3600(J)
Zinc–tin alloys
corrosion of, in 95°C, low-conductivity, aerated, distilled water, 9: 2725
Zinc–tin–aluminum alloys
corrosion of, in 95°C, low-conductivity, aerated, distilled water, 9: 2725
Zirconium
amperometric titration of, in presence of fluoride ion, 9: 540(J)
books, 9: 209(J)
chemical analysis, review, 9: 4200(J)
combustion in air and O_2, 9: 3498(R)
corrosion in water and aqueous media at 600 and 680°F, 9: 1822
coupled to Al alloys, galvanic corrosion in H_2SO_4 solutions, 9: 3151(J)
determination of, in mixtures with Th, Fe, and Ti, by use of 2,4-dichlorophenoxyacetic acid, 9: 2641(J)
diffusion of H_2 and D_2 in, 9: 244(J)
dissolution of, in acids, 9: 2783(J)
effect of injected, on tissue distribution of Pu in rats, 9: 3(R)
electrodeposition of, from aqueous, nonaqueous, and fused-salt electrolytes, 9: 1895
friction testing of halogenated hydrocarbon lubricated, 9: 961(R)
gravimetric determination of, in Nb–U ternary alloys, 9: 4074
gravimetric determination of, with p-chloromandelic acid, 9: 4074
grinding, for production of Zr powder, 9: 1853
heat transfer coefficients of, in liquid NaK and Na, 9: 1254
light produced by combustion of, in O, analysis of, 9: 1894(J)
mass transfer and corrosion by liquid NaK and Na and microstructure, 9: 1254
neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 3443(J)
neutron reactions (n,nγ), γ yields and energies from, 9: 4204(R)
oxidation of, under conditions of linear temperature increase, 9: 182
photometric determination of, in aluminum alloys, 9: 3545(J)
polarographic determination in aqueous solution, 9: 2099(R)
preferred orientation, 9: 190(R)
preferred orientation of β-annealed, 9: 189
preparation by bomb reduction of Zr compounds, 9: 169
production by caustic leaching of zircon sand, 9: 586
production of, by caustic soda fusion of Zr ores, 9: 1259(J)
production of, from K_2ZrF_6 in an electrolyte of fused NaCl, 9: 3201(J)
radiochemical determination, 9: 876, 2634
rate of solution of Hf-free, in HF solutions, 9: 3144
ratio of Hf to, in minerals and rocks, 9: 1522(J)
reaction of N with and diffusion of N in, at high temperatures, 9: 2145(J)
Zirconium (cont'd)
scaling in N_2 and air at elevated temperatures, 9: 967(R)
scaling of arc-melted iodide, in air, O_2, N_2, and mixtures of O_2 and N_2 from 600 to 1300°C, 9: 3458(R)
self-diffusion, tracer study, 9: 630
solubility and decomposition pressures of H in, 9: 1877(J)
sonic inspection of arc-cast, 9: 4167
spectrographic determination of, in ores and rocks, 9: 162
spectrophotometric determination, 9: 4074
spectroscopic analysis for Hf, 9: 3074(J)
spectroscopic determination, 9: 4084(J)
surface area changes and corrosion rate of, measurement, 9: 3143
tensile properties of arc-melted, from −195 to 500°C, 9: 3179
tensile properties of cold-reduced crystal-bar, at 300°C, 9: 3180(R)
thermal conductivity, 9: 4266(R)
thermal oxidation of, influence of anodic oxide films on, 9: 203(J)
toxicity and diagnostic and therapeutic uses, 9: 845(J)
turbidimetric microdetermination of, 9: 88(J)
Zirconium (liquid)
chemical reactions in water, 9: 4175(R)
Zirconium alloys
extrusion of Zircalogy 1 by Ugine-Sejournet glass process, 9: 2742
production of, by consumable electrode arc melting, 9: 3533(J)
room- and elevated-temperature mechanical properties and heat treatment, 9: 3840(R)
sonic inspection of arc-cast, 9: 4167
Zirconium aluminides
metallurgical properties, survey, 9: 3822(J)
Zirconium–aluminum alloys
creep-rupture, 9: 190(R)
creep-rupture at elevated temperatures, 9: 2727(R)
Zirconium–aluminum compounds (intermetallic)
crystal structure and properties of, 9: 2762(J)
Zirconium–aluminum–nickel alloys
preparation, density, resistivity, stress-rupture, and transverse rupture strength of hot-pressed, 9: 3165(R)
Zirconium–aluminum–titanium alloys
hardness, crystal structure, and phase studies, 9: 3520
impact testing, presintering and sintering and stress-rupture testing of sintered, 9: 3850(R)
Zirconium borides
metallurgical properties, survey, 9: 3822(J)
preparation by vacuum technique, 9: 1821(J)
properties of, effect of molten Ti on, 9: 2248
Zirconium–boron systems
size of interstitial solute atoms, lattice expansion, and electronic properties of close-packed, 9: 1780(J)
Zirconium carbides
properties of, effect of molten Ti on, 9: 2247
Zirconium chloride complexes
with phosphorus pentachloride, $ZrCl_4$ recovery from, 9: 1425(P)
Zirconium chlorides
bomb reduction of, to prepare Zr, 9: 169
preparation and analysis, 9: 169
recovery of, from complex compounds of $ZrCl_4$ and PCl_5, 9: 1425(P)
reduction of, for production of Zr powder, 9: 1853
Zirconium–chromium alloys
creep-rupture, 9: 190(R)

Zirconium–chromium alloys (cont'd)
preferred orientation of cold-rolled and cold-rolled and annealed, 9: 3180(R)
preparation and fabrication, 9: 3179
tensile properties, from –195 to 500°C, particle-strengthening effects on, 9: 3179
tensile properties of, from –195 to 500°C, 9: 3180(R)
Zirconium compounds
production by caustic leaching of zircon sand, 9: 586
toxicity and diagnostic and therapeutic uses, 9: 845(J)
Zirconium couples
addition compounds with diethyl phthalate, preparation and properties, 9: 72(J)
Zirconium fluorides
bomb reduction of, to prepare Zr, 9: 169
preparation and analysis, 9: 169
vapor pressure, 9: 548(J)
Zirconium iodates
composition of, precipitated from solution containing KIO_3, 9: 70(J)
Zirconium–iron alloys
creep rupture, 9: 190(R)
Zirconium isotopes Zr^{88}
gamma spectrum and decay scheme of, 9: 1669
Zirconium isotopes Zr^{88}
decay of, isomeric state of Y^{88} in, 9: 3684(J)
decay schemes, 9: 61(R)
Zirconium isotopes Zr^{89}
decay schemes, 9: 735
Zirconium isotopes Zr^{95}
decay scheme, literature survey, 9: 2068(J)
Zirconium isotopes Zr^{97}
gamma emission, 9: 1407(J)
Zirconium–magnesium alloys
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)
tungsten-argon arc welding of, 9: 2737
Zirconium–magnesium–rare earth alloys
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)
Zirconium–magnesium–thorium alloys
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)
Zirconium–molybdenum alloys
creep-rupture, 9: 190(R)
fabrication, 9: 1530(R)
fabrication and tensile properties of, from –195 to 500°C, 9: 3180(R)
Zirconium–niobium alloys
fabrication and phase studies, 9: 1530(R)
preferred orientation of β-annealed, 9: 189
Zirconium nitrides
vaporization and heat of formation of, 9: 2153(J)
Zirconium–nitrogen systems
size of interstitial solute atoms, lattice expansion, and electronic properties of close-packed, 9: 1780(J)
Zirconium ores
caustic soda fusion of, for production of Zr, 9: 1259(J)
x-ray spectrographic analysis for Hf, 9: 3073(J)
Zirconium oxide crucibles
preparation and properties of, for molten Ti, 9: 2246
Zirconium oxide–lanthanum oxide systems
heat treatment and phase studies, 9: 3141(J)
Zirconium oxide–neodymium oxide systems
heat treatment, phase studies, and thermal expansion, 9: 3141(J)
Zirconium oxide–silicon oxide–sodium oxide systems
physical and chemical properties and crystallography of phases in, 9: 2138(J)
Zirconium oxide–titanium systems
hardness and microstructure, 9: 2246
powder metallurgy, 9: 3496
Zirconium oxide–uranium oxide systems
x-ray diffraction patterns, 9: 127
Zirconium oxides
band spectra of ZrO, 9: 3798(J)
combined with oxides of V, Cr, Mo, W, and Mn, preparation and fluorite structures of, 9: 857(J)
heat and free energy of formation, 9: 529(J)
high purity, preparation, 9: 868(J)
isotopic equilibration determination of O in, 9: 3394
preparation and analysis, 9: 169
production, cost factors, and uses of zirconia, 9: 151(J)
properties of, effect of molten Ti on, 9: 2246
reaction of Th with, at high temperatures, 9: 1247
rotational analysis of the x and γ systems of, 9: 1228(J)
Zirconium–oxygen–phosphorus systems
metallic phases in, 9: 858(J)
Zirconium–oxygen systems
isotopic equilibration determination of O in, 9: 3394
size of interstitial solute atoms, lattice expansion, and electronic properties of close-packed, 9: 1780(J)
Zirconium powders
combustion of, at atmospheric pressures, 9: 57(R)
production of, by reduction of Zr chloride and grinding, 9: 1853
resistance sintering under pressure, 9: 1878(J)
Zirconium silicides
crystal structure of ZrSi and $ZrSi_2$, 9: 1010(J)
Zirconium sulfides
x-ray studies of, 9: 887(J)
Zirconium–tantalum alloys
fabrication and phase studies, 9: 1530
preferred orientation, 9: 190(R)
Zirconium–tin alloys
corrosion in water and aqueous media at 600 and 680°F, 9: 1822
fabrication, 9: 1530
preparation, fabrication, and effect of heat treatment on mechanical properties and grain size, 9: 966
Zirconium–titanium alloys
fabrication, 9: 1530(R)
hot-rolled textures of, 9: 1836(R)
Zirconium–titanium couples
diffusion of Zr in, tracer study, 9: 630
Zirconium–uranium alloys
explosive properties of, during dissolution, etching, and pickling in nitric acid and HCl–ethyl acetate solutions, 9: 127
microstructure, phase studies, and x-ray diffraction patterns, 9: 127
phase studies, 9: 3354(J)
thermal conductivity at 70°C, 9: 1879(J)
Zirconium–water systems
drying and explosive limits, 9: 1853

Zircons
caustic leaching, 9: 586
Zirconyl chlorides
ignition of, to prepare ZrO_2, 9: 169
preparation, purification, and analysis, 9: 169
ZOE Reactor
nonlinear kinetics, 9: 3979(J)
Zuni Uplift (N. Mex.)
geophysical exploration, 9: 2709

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Volume 9 — January 15 — June 30, 1955 — No. 12B

NUMERICAL INDEX OF REPORTS

Numerical Index of Official Atomic Energy Reports with Indications of Their Availability.

This Numerical Index of Reports is divided into two parts: Part I—all USAEC reports abstracted or listed in *Nuclear Science Abstracts (NSA)*, Vol. 9, Nos. 1-12A; Part II—all non-USAEC reports abstracted or listed in *NSA*, Vol. 9, Nos. 1-12A. In addition to the report number and corresponding abstract number, the Index includes a brief statement regarding the availability of each USAEC report listed; this information is given for non-USAEC reports also when it is available.

Nuclear Science Abstracts, Vol. 7, No. 24A, Dec. 31, 1953, includes a cumulated Numerical Index of Reports covering all reports in *Abstracts of Declassified Documents (ADD)* and in *NSA*, Vols. 1-7, together with the latest availability information as of Dec. 31, 1953. Information concerning reports abstracted in *NSA*, Vol. 8, appears in *NSA*, Vol. 8, No. 24A, Dec. 31, 1954. A completely cumulated listing covering all volumes of *ADD* and *NSA* through Vol. 8 is issued as a separate publication, TID-4000. Each issue of *NSA*, Vol. 9 (1955), contains information concerning reports abstracted in that issue. A complete annual cumulation will appear in No. 24A (Dec. 31, 1955). In addition, each issue contains new information concerning the availability of reports previously abstracted.

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ADD	Abstracts of Declassified Documents, the predecessor of NSA.
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Sale Price (GPO)	USAEC or other report for sale through the U. S. Government Printing Office.
In ...	Reports contained in published books.
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LC	Available from Library of Congress, Washington, D. C.
Dep.(mc); Ind. Dep.	A report held by the other All Depository Libraries in microcard form only is available in full-size copies at the Industrial Depository Libraries.
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Journal (with specific citation)	Report has been published as cited.
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NRC	Available from National Research Council of Canada, Ottawa, Ontario, Canada.
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MDDC – To declassified reports released by the Manhattan Engineer District and by the Atomic Energy Commission before March 1, 1948.

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PART I

Report	Abstract	Availability
ACCO		
16	9-159	Dep.(mc)
ACRH		
2	9-3748	Dep.
AEC-tr		
367	9-1930	See TT-167
794	9-1376	See BNL-L-62(pi59-62)
979	9-915	See TT-237
1289	9-1748	See TT-300
1321	9-1556	Henry Brutcher (Trans. No. 2769), Altadena, Calif.
1459	9-886	See TT-343
1953	9-3307	JCL
1961	9-236	JCL
1962	9-275	LC
1963	9-193	Henry Brutcher (Trans. No. 3231) Altadena, Calif.
1964	9-194	Henry Brutcher (Trans. No. 3083), Altadena, Calif.
1965	9-156	JCL
1966	9-1258	JCL
1967	9-63	LC
1968	9-64	LC
1969	9-522	JCL
1970	9-80	Associated Technical Services (Trans. 19F4C) East Orange, N. J.
1971	9-195	Henry Brutcher (Trans. No. 3240), Altadena, Calif.
1972	9-1284	LC
1973	9-640	Henry Brutcher (Trans. No. 3405), Altadena, Calif.
1974	9-435	JCL
1975	9-471	LC

Report	Abstract	Availability
AEC-tr		
1976	9-535	Associated Technical Services (Trans. No. 29F4C), East Orange, N. J.
1977	9-536	Associated Technical Services (Trans. No. 31F4C), East Orange, N. J.
1978	9-523	Associated Technical Services (Trans. No. 32F4C), East Orange, N. J.
1979	9-1158	JCL
1980	9-855	JCL
1981	9-882	Associated Technical Services (Trans. 33F4C), East Orange, N. J.
1982	9-891	JCL
1983	9-917	JCL
1984	9-856	LC
1985	9-883	JCL
1986	9-818	JCL
1987	9-902	JCL
1988	9-1214	JCL
1989	9-1215	JCL
1990	9-1184	JCL
1991	9-1216	JCL
1992	9-1063	JCL
1993	9-1765	JCL
1994	9-1793	JCL
1995	9-1865	Henry Brutcher (Trans. No. 3281), Altadena, Calif.
1996	9-1768	LC
1997	9-1706	JCL
1998	9-1866	Henry Brutcher (Trans. No. 3414), Altadena, Calif.
1999	9-1867	Henry Brutcher (Trans. No. 2907), Altadena, Calif.
2000	9-1809	LC
2058	9-2003	Associated Technical Services, East Orange, N. J.
2059	9-[illegible]	Associated Technical Services (Trans. No. 76F4F), East Orange, N. J.
2060	9-1610	LC
2061	9-1794	JCL
2062	9-1795	JCL
2063	9-1811	JCL
2064	9-1947	JCL
2065	9-1796	JCL
2066	9-2130	JCL
2067	9-1940	Associated Technical Services (Trans. No. 85F4G) East Orange, N. J.
2068	9-2138	JCL
2069	9-2139	JCL
2070	9-2475	Associated Technical Services (Trans. 83F4G), East Orange, N. J.
2071	9-2476	JCL
2072	9-2477	Associated Technical Services (Trans. 84F4G), East Orange, N. J.
2073	9-2504	JCL
2074	9-2140	JCL
2075	9-2387	JCL
2076	9-2388	JCL
2077	9-2358	JCL
2078	9-2389	JCL
2079	9-2743	LC
2080	9-2953	JCL
2081	9-2016	LC
2082	9-2030	JCL
2083	9-1744	JCL
2084	9-2796	LC
2086	9-2796	JCL
2087	9-2017	Associated Technical Services (Trans. 96G4G), East Orange, N. J.
2088	9-3045	JCL
2089	9-3164	JCL
2091	9-3078	Associated Technical Services (Trans. 05G5G), East Orange, N. J.
2093	9-3056	JCL
2094	9-3127	
2095	9-3147	
2096	9-3128	
2097	9-3148	
2098	9-3217	
2099	9-3155	Henry Brutcher (Trans. No. 3474), Altadena, Calif.
2100	9-3711	Henry Brutcher (Trans. No. 3475), Altadena, Calif.
2101	9-3387	JCL
2102	9-3388	JCL
2103	9-3447	JCL
2105	9-3485	LC
2106	9-3511	JCL
2107	9-3668	Associated Technical Services (Trans. 19G5G), East Orange, N. J.
2108	9-3731	LC
2109	9-3905	
2110	9-3908	JCL
2111	9-3762	LC
2112	9-4015	JCL
2113	9-3784	LC
2114	9-3780	LC
2115	9-3874	LC
2116	9-3763	Associated Technical Services (Trans. 14G5J), East Orange, N. J.
2117	9-3764	Associated Technical Services (Trans. 16G5J), East Orange, N. J.
2118	9-3765	Associated Technical Service (Trans. 15G5J), East Orange, N. J.
2119	9-3996	Associated Technical Services (Trans. 35G5G), East Orange, N. J.
2120	9-4189	JCL
2122	9-4213	Associated Technical Services (Trans. 49G5G), East Orange, N. J.
2123	9-4248	LC
2124	9-4224	Associated Technical Services (Trans. 48G5G), East Orange, N. J.
2127	9-4287	LC
2128	9-4190	JCL
AECD		
3639	9-987	Dep.(mc)
3640	9-169	Dep.(mc)
3641	9-2837	Dep.
3642	9-2404	Dep.; $0.25
AECU		
2779	9-966	Dep.
2938	9-50	J. Phys. Chem. 58, 805-11(1954); Dep.(mc)
2942	9-292	Dep.(mc)
2944	9-293	Dep.(mc)
2945	9-9	Dep.
2948	9-138	Dep.(mc)
2949	9-1893	Dep.(mc)
2950	9-926	Dep.(mc)
2951	9-10	Dep.(mc)
2952	9-11	Dep.
2953	9-532	Dep.(mc)
2954	9-152	Dep.(mc)
2955	9-143	Dep.(mc)
2956	9-3470	Phys. Rev. 98, 28-39(1955); Dep.; $0.45
2957	9-474	Dep.(mc)
2958	9-734	Dep.(mc)
2959	9-512	Dep.(mc)

Report	Abstract	Availability
AECU		
2961	9-546	Dep.(mc)
2963	9-547	Dep.(mc)
2963	9-1133	Dep.(mc)
2964	9-648	Dep.(mc)
2965	9-513	Dep.(mc)
2966	9-649	Dep.(mc)
2967	9-2589	Dep.
2968	9-514	Dep.(mc)
2969	9-1017	Dep.(mc)
2970	9-848	Dep.(mc)
2971	9-849	Dep.(mc)
2972	9-934	Dep.(mc)
2973	9-1066	Dep.(mc)
2974	9-850	Dep.(mc)
2975	9-2026	Dep.(mc)
2976	9-967	Dep.(mc); Ind. Dep.
2977	9-2546	Dep.
2978	9-1181	Dep.(mc)
2980	9-1580	Dep.(mc)
2981	9-1550	Dep.
2982	9-1597	Dep.(mc)
2983	9-1962	Dep.(mc)
2984	9-1963	Dep.(mc)
2985	9-2106	Dep.(mc)
2986	9-2107	Dep.(mc)
2987	9-2108	Dep.(mc)
2989	9-2207	Dep.
2990	9-2330	Dep.(mc)
2991	9-2331	Dep.(mc)
2992	9-2251	Dep.(mc)
2993	9-2723	Dep.(mc)
2995	9-3660	Dep.
2996	9-1863	Dep.(mc)
2997	9-3442	Dep.(mc)
2998	9-2989	Dep.(mc)
2999	9-2990	Dep.(mc)
3000	9-3143	Dep.
3001	9-3210	Dep.(mc)
3002	9-3144	Dep.(mc)
3004	9-2948	Dep.(mc)
3005	9-3211	Dep.(mc)
3006	9-3251	Dep.(mc)
3007	9-3381	Dep.(mc)
3008	9-3574	Dep.(mc)
3009	9-3575	Dep.(mc)
3010	9-3576	Dep.(mc)
3011	9-3816	Dep.(mc)
3013	9-3458	Dep.(mc); Ind. Dep.
3014	9-3751	Dep.(mc)
3015	9-3995	Dep.(mc)
3016	9-3722	Dep.(mc)
3017	9-3723	Dep.(mc)
3018	9-3724	Dep.(mc)
3019	9-3725	Dep.(mc)
3020	9-3823	Dep.(mc)
3021	9-4205	Dep.(mc)
3024	9-4145	Dep.(mc)
ANL		
4863	9-830	Dep.
5135	9-127	Dep.
5227	9-618	Dep.
5256	9-360	Dep.(mc)
5276	9-1804	Dep.
5304	9-608	Dep.
5306	9-817	Dep.
5312	9-[illegible]5	Dep.

Report	Abstract	Availability
ANL		
5316	9-[illegible]4	Dep.
5317	9-918	Dep.
5319	9-2691	Dep.
5332	9-3	Dep.
5359	9-3501	Dep.
5365	9-1231	Dep.
5368	9-4237	Dep.
5378	9-2538	Dep.
5378(p.65-186)	9-2547	
5378(p.2-64)	9-2539	
5381	9-2949	Dep.
5386	9-2509	Dep.
5405	9-37[illegible]	Dep.
5410	9-4[illegible]	Dep.
APEX		
176	9-2953	Dep.
179	9-2700	Dep.
BM-RI		
5126	9-4167	Dep.(mc)
BMI		
706	9-1501	Dep.; $0.35
970	9-1854	Dep.; $0.20
982	9-3113	Dep.(mc); Ind. Dep.
BNL		
278	9-695	Dep.; $0.55
280	9-3975	Dep.
303	9-4038	Dep.
305	9-3004	Dep.
308	9-728	Dep.; $0.25
314	9-2099	Dep.
317	9-1781	Dep.; $0.20
322	9-3285	Dep.
323	9-3120	Dep.
326	9-4019	Dep.
1604	9-28	Genetics 39, 587-603(1954)
1696	9-85[illegible]	J. Polymer Sci. 14, 427-42(1954)
1781	9-1224	Nucleonics 12, No. 12, 14-[illegible]8(1954); Dep.(mc)
1794	9-141[illegible]	Dep.(mc)
1816	9-14[illegible]7	Dep.(mc)
1831	9-121[illegible]	Anal. Chem. 27, 166-7(1955); Dep.(mc)
1835	9-472	Arch. Internal Med. 94, 521-31(1954)
1854	9-2144	J. Chem. Phys. 23, 152-4(1955)
1855	9-92[illegible]	Textile Research J. 24, 785-91(1954)
1857	9-400[illegible]	Combined with BNL-1885 and BNL-1886 in J. Chem. Phys. 23, 673-80(1955)
1858	9-873	J. Am. Chem. Soc. 76, 6006-8(1954)
1874	9-1315	Dep.(mc)
1879	9-1782	J. Chem. Phys. 22, 2026-[illegible](1954)
1880	9-3369	Ann. N. Y. Acad. Sci. 59, 514-35(1955)
1885	9-4099	Combined with BNL-1857 and BNL-1886 in J. Chem. Phys. 23, 673-80(1955)
1886	9-4097	Combined with BNL-1857 and BNL-1885 in J. Chem. Phys. 23, 673-80(1955)
1888	9-538[illegible]	J. Am. Chem. Soc. 76, 4054(1954)
1890	9-473	J. Biol. Chem. 211, 279-87(1954)
1891	9-561	Nucleonics 12, No. 11, 55(1954)
1903	9-565	Nucleonics 12, No. 11, 61(1954)
1906	9-996	J. Chem. Phys. 22, 1924-5(1954)
1912	9-311	Rev. Sci. Instr. 25, 1025(1954)
1915	9-765	Phys. Rev. 96, 709-12(1954)
1925	9-587	Nucleonics 12, No. 11, 75(1954)
1931	9-610	Nucleonics 12, No. 11, 78-9(1954)
1940	9-1729	Biol. Bull. 107, 329-34(1954)

Report	Abstract	Availability
BNL		
1944	9-1132	Phys. Rev. 96, 1014-17(1954)
1945	9-3006	Proc. Natl. Acad. Sci. U. S. 41, 155-60 (1955)
1950	9-2840	J. Chem. Phys. 23, 477-82(1955); Dep.(mc)
1961	9-2648	J. Phys. Chem. 59, 189-91(1955)
1962	9-124	Arch. Biochem. and Biophys. 52, 484-5 (1954)
1964	9-2656	Nucleonics 13, No. 2, 48(1955)
1967	9-3061	J. Am. Chem. Soc. 77, 1388-90(1955)
1977	9-991	Phys. Rev. 96, 951-68(1954)
1995	9-1588	Rev. Sci. Instr. 25, 1219(1954)
1998	9-1679	Phys. Rev. 96, 1610-13(1954)
2002	9-3279	Phys. Rev. 97, 1023-4(1955)
2004	9-483	Science 120, 809-10(1954)
2010	9-1054	Rev. Sci. Instr. 25, 1129(1954)
2013	9-2921	Phys. Rev. 97, 766-9(1955)
2039	9-1986	Phys. Rev. 97, 181-3(1955)
2045	9-1154	Dep.(mc)
2047	9-2940	Phys. Rev. 97, 797-808(1955)
2052	9-475	Science 121, 641-2(1955); Dep.(mc)
2055	9-3645	Phys. Rev. 97, 1199-1204(1955)
2056	9-4303	Phys. Rev. 98, 100(1955)
2060	9-1355	Phys. Rev. 96, 1450-2(1954)
2062	9-3718	Am. J. Botany 42, 384-94(1955)
2063	9-476	Dep.(mc)
2064	9-1682	Phys. Rev. 96, 1712-13(1954)
2066	9-2922	Phys. Rev. 97, 780-2(1955)
2071	9-1155	Arch. Biochem. Biophys. 54, 556-7(1955); Dep.(mc)
2072	9-3337	Phys. Rev. 97, 991-1002(1955)
2075	9-1366	Rev. Sci. Instr. 26, 232-3(1955); Dep.(mc)
2088	9-2006	Phys. Rev. 97, 243(1955)
2089	9-3651	Phys. Rev. 97, 1303-4(1955)
2096	9-2692	Dep.(mc)
2099	9-4090	J. Chem. Phys. 23, 759-60(1955)
2113	9-2787	Dep.(mc)
2114	9-2200	J. Am. Chem. Soc. 77, 507(1955)
2128	9-3680	Phys. Rev. 97, 1314-24(1955)
2140	9-2413	Rev. Sci. Instr. 26, 402-3(1955); Dep.(mc)
2143	9-3318	Phys. Rev. 97, 1186-8(1955)
2153	9-4257	Phys. Rev. 98, 121-30(1955)
2154	9-3238	Phys. Rev. 97, 1179-80(1955)
2176	9-4102	J. Chem. Phys. 23, 764-5(1955)
2177	9-4270	Phys. Rev. 98, 212-14(1955)
2204	9-4262	Phys. Rev. 98, 218-19(1955)
2208	9-4259	Phys. Rev. 98, 205-6(1955)
2242	9-4216	Dep.(mc)
2255	9-4044	Dep.(mc)
2275	9-4100	Dep.(mc)
2284	9-4042	Dep.(mc)
2294	9-4207	Dep.(mc)
BNL-L		
62(p.159-62)	9-1376	LC
CF (ORNL)		
53-12-111	9-2984	See ORNL-1840
54-9-54	9-3803	Nucleonics 13, Vol. 4, 66-9(1955) (Condensed)
COO		
148	9-3890	Dep.(mc)
161	9-685	Chem. Eng. Progr. 50, 560-4(1954)
163	9-2211	Anal. Chem. 27, 83-7(1955)
186	9-539	Anal. Chem. 26, 1572-5(1954)
206	9-1530	Dep.(mc); Ind. Dep.
CU (Misc.)		
15-54-AEC-1019-Chem.	9-1590	See NYO-6139
20-54-AEC-904-MET	9-1861	See NYO-3968
134	9-3965	Dep.(mc)
DP		
62	9-1598	Dep.
79	9-298	Dep.
81	9-153	Dep.(mc)
88	9-1196	Dep.
93	9-1596	Dep.
94	9-2725	Dep.
95	9-1942	Dep.
99	9-2194	Dep.
110	9-3925	Dep.
111	9-3926	Dep.
112	9-4229	Dep.
F-TS		
7083-RE	9-3911	see AEC-tr-2106
FMPC		
471	9-1283	Dep.
GEL		
90	9-609	Dep.
HW		
10792	9-299	Dep.; $0.10
29071(Rev.)	9-629	Dep.; $0.10
30185	9-3212	Dep.(mc)
30220	9-501	Dep.(mc)
30231	8-6077	Radiation Research 2, 166-70(1955)
30340	9-12	Dep.(mc)
30781	9-549	Nucleonics 12, No. 11, 54(1954) (Condensed); Dep.; $0.25
31925	9-368	Dep.; $0.20
31961	9-2950	Dep.
32121	9-400	Dep.(mc); Ind. Dep.
32166	9-696	Dep.; $0.25
32626	9-585	Dep.
32676	9-128	Dep.
33122	9-3927	Dep.
33744	9-1703	Dep.(mc)
33881	9-3825	Dep.
34032	9-942	Dep.(mc)
35174	9-3752	Dep.(mc)
IDO		
14320	9-533	Dep.(mc)
16073	9-2446	Dep.; $0.35
16194	9-271	Dep.(mc)
16205	9-2050	Dep.(mc)

Report	Abstract	Availability
ISC		
255(Rev.)	9-2155	J. Am. Chem. Soc. 77, 324-5(1955)
380	9-2788	Dep.
405	9-1759	Dep.(mc)
437(Rev.)	9-586	Dep.; $0.20
454	9-1599	Dep.(mc)
464	9-1302	Dep.(mc)
465	9-595	J. Phys. Chem. 58, 908-11(1954)
489	9-1121	Dep.
489	9-2082	Spectrochim. Acta 6, 341-72(1954)
497	9-1036	Dep.
498	9-2821	Phys. Rev. 95, 413-17(1954); Dep.
499	9-1037	Dep.(mc); Ind. Dep.
509	9-4081	Anal. Chem. 27, 572(1955)
510	9-2951	Dep.
511	9-1680	Phys. Rev. 96, 1620(1954)
512	9-1790	Dep.(mc)
515	9-802	Dep.
517	9-2133	Dep.
518	9-989	Dep.
520	9-875	Dep.
521	9-851	Dep.
522	9-2506	Phys. Rev. 97, 432-3(1955)
533	9-1994	Dep.(mc)
537	9-3339	Phys. Rev. 97, 1031-3(1955)
543	9-1219	Dep.(mc)
547	9-931	Dep.
548	9-1212	Dep.(mc); Ind. Dep.
550	9-1247	Dep.; $0.20
551	9-1213	Dep.; $0.25
552	9-3444	Dep.(mc)
553	9-1481	Dep.(mc); Ind. Dep.
554	9-1760	Dep.(mc)
558	9-2022	Dep.(mc)
560	9-2382	Dep.(mc); Ind. Dep.
561	9-2023	Dep.(mc)
564	9-2726	Dep.(mc)
565	9-3052	Dep.(mc)
569	9-3246	J. Am. Chem. Soc. 77, 1393(1955)
572	9-3170	Dep.
577	9-4266	Dep.(mc)
578	9-3242	Dep.(mc); Ind. Dep.
581	9-3053	Dep.(mc)
K		
1148	9-898	Dep.
1186	9-2789	Dep.
1187	9-3445	Dep.
1190	9-2838	Dep.
1191	9-3213	Dep.
1204	9-3410	Dep.
KAPL		
950	9-369	Dep.
973	9-4117	Dep.
1138	9-3286	Dep.
1161	9-3121	Dep.
1178	9-36	Dep.
1180	9-428	Dep.
1198	9-154	Dep.
1201	9-300	Nucleonics 13, No. 5, 54-6(1955); Dep.
1205	9-172	Dep.
1213	9-272	Dep.

Report	Abstract	Availability
KAPL		
1227	9-969	Dep.
1231	9-1038	Dep.
1232	9-819	Dep.
1236	9-1308	Dep.
1237	9-1317	Dep.
1241	9-1655	Dep.
1242	9-1118	Dep.
1243	9-1582	Dep.
1248	9-1822	Dep.
1262	9-2517	Dep.
1265	9-2689	Dep.
1269	9-2927	Dep.
1275	9-2162	Dep.
1276	9-2827	Dep.
1277	9-2655	Dep.
1280	9-3287	Dep.
1300	9-4075	Dep.
1307	9-4010	Dep.
1309	9-4169	Dep.
KLX		
1395	9-3122	Dep.
LA		
1651	9-619	Dep.
1654	9-376	Dep.
1667	9-1823	Dep.
1668	9-620	Dep.
1686	9-155	Dep.
1694	9-301	Dep.
1706	9-1761	Dep.
1713	9-302	Dep.
1721	9-876	Dep.
1725	9-692	Dep.
1727	9-1896	Dep.
1730	8-1824	Dep.
1734	9-1697	Dep.
1736	9-2016	Phys. Rev. 98, 41-2(1955); Dep.
1740	9-1551	Dep.
1835	9-3928	Dep.
1837	9-1600	Nucleonics 13, No. 5, 62(1955); Dep.
1845	9-1762	Dep.
1848	9-1711	Dep.
1849	9-3007	Dep.
1851	9-1739	Dep.
1855	9-1740	Dep.
1856	9-1943	Dep.
1864	9-4110	Dep.
1867	9-3811	Dep.
1878	9-3913	Dep.
LRL		
138	9-370	Dep.; $0.35
145	9-799	Dep.; $0.25
157	9-144	Dep.(mc); Ind. Dep.
MITS		
26	9-3111	See NYO-6263
ML		
240	9-772	Dep.; $0.25
252	9-3660	See AECU-2995

Report	Abstract	Availability
MLM		
656	9-1479	Dep.; $0.25
735	9-76	Dep.(mc)
788(Rev.)	9-1490	Dep.
818	9-1236	Dep.
871	9-3929	Dep.
891	9-1475	Dep.; $0.25
901	9-54	Dep.
909	9-3757	Dep.
921	9-1235	Dep.
934	9-2181	Dep.
938	9-2399	Anal. Chem. 27, 567-9(1955); Dep.
943	9-2952	Dep.
956	9-2844	Dep.
973	9-4060	Dep.
967	9-2671	Dep.
970	9-2054	Dep.; $0.20
997	9-2332	Dep.
1002	9-3793	Dep.
MTA		
45	9-774	Dep.(mc)
NAA-AER		
1018	9-1953	Nucleonics 13, No. 1, 64(1955) (Condensed)
NAA-SR		
278	9-2	Dep.; $0.45
863	9-3097	Dep.(mc)
985	9-139	Dep.; $0.45
1014	9-631	Dep.
1050	9-852	Dep.
1061	9-1478	Dep.
1103	9-2163	Dep.
1159	9-3861	Dep.; Ind. Dep.
1239	9-3862	Dep.
NAA-SR-Memo		
707	9-4285	Dep.(mc)
1107	9-3914	Dep.; Ind. Dep.
NBL		
104	9-3070	Dep.
NBS		
3339	9-273	Dep.(mc)
3756	9-1418	Dep.
3845	9-3117	Dep.
3992	9-3892	Dep.(mc)
4005	9-3893	Dep.(mc)
NDA		
5C-12	9-2031	Dep.(mc)
5C-39	9-1106	Dep.
5C-40	9-1107	Dep.
NDA-Memo		
5C-63	9-2518	Dep.(mc)
NEVIS		
	9-775	Phys. Rev. 97, 492-504(1955); Dep.(mc)
	9-4253	Dep.(mc)
	9-4254	Dep.(mc)

Report	Abstract	Availability
NNES		
I-9	9-656	See TID-5211
I-11	9-145	See TID-5210
NYO		
474	9-820	Dep.
1589	9-932	Dep.(mc)
3075	9-2472	Dep.; $1.25
3131	9-800	Dep.
3365	9-621	Dep.(mc)
3366	9-622	Dep.(mc)
3490	9-1285	J. Appl. Phys. 25, 1538-42(1954)
3497	9-2734	Dep.
3498	9-1860	Dep.
3525	9-58	Dep.(mc)
3605	9-3396	Anal. Chem 27, 459-61(1955)
3607	9-3395	Anal. Chem. 27, 340-6(1955)
3609	9-1205	Anal. Chem. Acta 11, 574-85(1954)
3626	9-953	Part A, p14-17; Part B, p10-13; Part C, p18-20 of: Proceedings of the Conference on Nuclear Processes in Geologic Settings, Williams Bay, Wisconsin, Sept. 21-23, 1953. (Printed by Univ. of Chicago Press, 1954)
3627	9-2265	Ann. Rev. Nuclear Sci. 4, 401-62(1954)
3637	9-1752	J. Phys. Chem. 59, 80-4(1955)
3780	9-2051	Dep.(mc)
3781	9-1040	Dep.(mc)
3782	9-3932	Dep.(mc)
3791	9-2098	Dep.(mc)
3823	9-394	Dep.(mc)
3845	9-1091	Phys. Rev. 96, 1100-3(1954)
3863	9-2854	Dep.(mc)
3896	9-3772	J. Am. Chem. Soc. 77, 1473-6(1955)
3917	9-636	Dep.(mc)
3934-II	9-4234	Dep.(mc)
3956(Suppl.)	9-2333	Dep.(mc)
3968	9-1861	Dep.
3974	9-2520	Dep.(mc)
4005	9-5	Dep.(mc)
4603	9-531	Dep.(mc)
4604	9-534	Dep.
4616	9-2855	Dep.
4916	9-3376	Dep.
4917	9-3047	Dep.
4964	9-17	Cancer Research 15, 100-4(1955); Dep.
4968	9-18	Dep.(mc)
4986	9-1736	J. Gen. Physiol. 38, 389-404(1955)
4987	9-1735	J. Gen. Physiol. 38, 371-88(1955)
4989	9-4066	J. Histochem. Cytochem. 3, 103-21(1955)
4990	9-1704	Dep.; $0.80
6059	9-1511	Dep.(mc)
6060	9-3461	Dep.
6061	9-3462	Dep.
6062	9-1826	Dep.(mc)
6063	9-1827	Dep.(mc)
6072	9-401	Dep.(mc)
6102	9-262	Dep.(mc)
6103	9-91	Dep.(mc)
6114	9-1862	Dep.(mc); Ind. Dep.
6139	9-1590	Dep.(mc)
6168 [Pt. 1.]	9-646	J. Electrochem. Soc. 101, 124-7(1954)
6256	9-166	Mining Eng. 6, 925-8(1954)
6257	9-1486	Mining Eng. 6, 1196-1202(1954); Dep.(mc)

Report	Abstract	Availability
NYO		
6259	9-1476	Anal. Chem. 27, 467-8(1955); Dep.(mc)
6261	9-3107	Mining Eng. 7, 66-72(1955)
6262	9-623	Dep.(mc)
6263	9-3111	Dep.(mc); Ind. Dep.
6277	9-864	J. Am. Chem. Soc. 76, 5833-9(1954)
6278	9-865	J. Am. Chem. Soc. 76, 5839-42(1954)
6296	9-653	Dep.
6297	9-2702	Dep.
6323	9-637	Dep.
6334	9-2735	Dep.
6386	9-3096	J. Am. Chem. Soc. 76, 6210(1954)
6391	9-3113	Can. J. Chem. 33, 245-50(1955)
6402	9-1187; 9-1229	J. Am. Chem. Soc. 76, 4755-63(1954); J. Am. Chem. Soc. 76, 4763-5(1954)
6403	9-109	J. Am. Chem. Soc. 76, 5216-20(1954)
6446	9-946	Dep.
6447	9-2793	Dep.
6511	9-2496	Dep.
6538	9-776	Phys. Rev. 97, 783-91(1955); Dep.(mc)
6541	9-1653	Dep.(mc)
6542	9-1140	Dep.(mc)
6543	9-1946	Dep.(mc)
6561	9-1565	Dep.(mc)
6567	9-777	Dep.(mc)
6568	9-1108	Dep.(mc)
6570	9-1909	Phys. Rev. 97, 240-2(1955)
6571	9-1111	Phys. Rev. 96, 1104-15(1954)
6572	9-1660	Phys. Rev. 96, 1654-8(1954)
6574	9-790	Phys. Rev. 96, 812(1954)
6583	9-245	Phys. Rev. 96, 532-3(1954)
6584	9-1114	Phys. Rev. 96, 1156-7(1954)
6585	9-869	J. Am. Chem. Soc. 76, 5887-8(1954)
6589	9-3390	J. Phys. Chem. 59, 235-7(1955)
6595	9-971	Dep.
6596	9-3675	J. Appl. Phys. 26, 128-9(1955)
6597	9-3886	J. Appl. Phys. 26, 491-2(1955)
6605	9-2151	J. Am. Chem. Soc. 77, 258-60(1955)
6608	9-4070	J. Am. Chem. Soc. 77, 265-6(1955)
6609	9-4071	J. Am. Chem. Soc. 77, 1994-5(1955)
6611	9-4072	J. Am. Chem. Soc. 77, 2011-12(1955)
6616	9-1467	Dep.
6617	9-2135	Dep.
6625	9-1681	Phys. Rev. 96, 1711-12(1954)
6660	9-1356	Phys. Rev. 96, 1452-3(1954)
6668	9-2924	Dep.(mc)
7006	9-3177	Dep.
7042	9-972	Dep.
7043	9-2294	Dep.
7072	9-973	Dep.
7073	9-2295	Dep.
7100	9-654	Dep.(mc)
ORNL		
991	9-2907	Dep.
1027	9-1641	Dep.; $0.25
1572	9-371	Dep.; $0.45
1641	9-2633	Dep.
1682	9-750	Dep.; $0.20
1744	9-3411	Anal. Chem. 27, 453-4(1955)
1747	9-129	Dep.; $0.35
1769	9-1492	Dep.; $0.35
ORNL		
1779	9-655	Dep.; $0.35
1798	9-1067	Dep.
1802	9-2794	Dep.
1807	9-2831	Dep.
1811	9-901	Dep.
1828	9-2385	Dep.
1830	9-2991	Dep.
1833	9-1825	Dep.
1840	9-2984	Dep.
1842	9-2845	Dep.(mc)
1848	9-3384	Dep.
1862	9-3330	Dep.
1876	9-4240	Dep.
ORO		
121	9-1807	Dep.
131	9-185	Dep.
132	9-1445	Dep.; $0.45
133	9-1156	Dep.
134	9-1555	Dep.; $0.25
135	9-2208	Dep.(mc)
137	9-4101	Dep.
P		
395-AEC	9-3442	See AECU-2997
540-AEC	9-1863	See AECU-2996
585-AEC	9-2989	See AECU-2998
591-AEC	9-2990	See AECU-2999
R		
53GL186	9-3288	Dep.
54GL289	9-609	See GEL-90
RL		
1148	9-189	See SO-2516
1175	9-187	See SO-2035
1190	9-188	See SO-2036
1191	9-190	See SO-2517
1237	9-1864	See SO-2037
1251	9-3179	See SO-2518
1259	9-3866	See SO-2038
1261	9-3180	See SO-2519
1291	9-3867	See SO-2039
RM		
1420-AEC	9-2990	See AECU-2999
RME		
22(Pt. 1)	9-160	Dep.; $0.25
63	9-1512	Dep.; $0.35
69(Pt. 1)	9-1513	Dep.; $0.20
70	9-1256	Dep.; $0.25
71	9-1828	Dep.; $0.20
2009	9-161	Dep.; $0.20
2010	9-1257	Dep.; $0.20
2011	9-2708	Dep.
2012	9-3154	Dep.
3092	9-1829	Dep.
3102	9-2262	Dep.; $0.45
3103	9-1514	Dep.
4058	9-624	Eng. Mining J. 156, 119-22(1955); Dep.(mc)

Report	Abstract	Availability
RMO		
2731	9-1183	Dep.(mc)
2732	9-1746	Dep.(mc)
2944	9-1792	Dep.(mc)
SO		
2035	9-187	Dep.(mc)
2036	9-188	Dep.(mc); Ind. Dep.
2037	9-1864	Dep.(mc)
2038	9-3866	Dep.(mc)
2039	9-3867	Dep.(mc)
2516	9-189	J. Metals 7, 395-400(1955); Dep.(mc); Ind. Dep.
2517	9-190	Dep.(mc); Ind. Dep.
2518	9-3179	Dep.(mc); Ind. Dep.
2519	9-3180	Dep.(mc); Ind. Dep.
TEI		
292	9-628	U. S. Geol. Survey Circ. 348, Free (USGS)
401	9-2514	Nuovo cimento 12, Suppl. No. 3, 549-71 (1954)
403	9-702	U. S. Geol. Survey Circ. 353, (USGS)
405	9-3829	Am. Mineralogist 40, 201-6(1955)
412	9-3398	Anal. Chem. 27, 475-6(1955)
413	9-1522	U. S. Geol. Survey Bull. 1021-A, 1955; $0.15 (GPO)
415	9-162	Dep.; $0.80
417	9-3471	Am. J. Sci. 253, 121-4(1955)
418	9-3464	Geochim. et Cosmochim. Acta 7, 61-76 (1955)
436	9-956	U. S. Geol. Survey Circ. 358. Free (USGS)
437	9-3466	U. S. Geol. Survey Circ. 349, 1955
450	9-880	Dep.; $0.25
453	9-78	Dep.; $0.25
461	9-881	Dep.; $0.10
TEM		
341A	9-2263	Dep.; $0.45
443A	9-2709	Dep.
644	9-3828	U. S. Geol. Survey
740	9-165	U. S. Geol. Survey Circ. 351; Free (USGS)
784	9-1515	Dep.; $0.25
82(Suppl. 2)	9-929	JCL
3032(Suppl. 1)	9-2077	Dep.; $0.20
3036(Rev.)	9-288	Dep.; $0.80
3058	9-233	Dep.; $0.25
5001(1st Rev.)	9-2100	Dep.; $2.10
5156	9-4146	Dep.(mc)
5210	9-145	Dep.; $1.75
5211	9-656	Dep.; $1.85
5252	9-2535	Dep.
U		
23920	9-3723	See AECU-3017
UCLA		
304	9-700	Dep.; $0.25
305	9-1966	Dep.(mc)
309	9-1042	Nucleonics 13, No. 3, 58-60(1955); Dep.; $0.20
311	9-37	Dep.(mc)
UCLA		
312	9-3033	Dep.(mc)
313	9-106	Dep.(mc)
314	9-6	Dep.(mc)
315	9-701	Dep.(mc)
316	9-1488	Dep.; $1.05
317	9-846	Dep.(mc)
318	9-2164	Dep.; $0.25
319	9-1462	Dep.(mc)
321	9-1764	Dep.(mc)
322	9-2334	Dep.(mc)
323	9-3747	Proc. Soc. Exptl. Biol. Med. 88, 475-7 (1955)
324	9-2550	Dep.(mc)
327	9-3005	Dep.(mc)
328	9-3753	Dep.(mc)
331	9-4056	Dep.(mc)
UCRL		
1427	9-778	Dep.; $0.25
1651 (2nd Rev.)	9-773	Dep.(mc)
1880	9-2416	Dep.; $0.55
2301	9-402	Dep.; $2.55
2351	9-34	J. Aviation Med. 25, 326-30(1954)
2393(2nd Rev.)	9-1659	Phys. Rev. 96, 1621-7(1954)
2579	9-304	Dep.(mc)
2579(Rev.)	9-4345	Dep.(mc)
2590	9-1388	Phys. Rev. 96, 1267-8(1954)
2597	9-803	Phys. Rev. 96, 730-4(1954)
2613	9-4020	Ann. Rev. Nuclear Sci. 4, 157-90(1954)
2621	9-767	Phys. Rev. 96, 714-15(1954)
2623	9-449	Dep.; $0.25
2631	9-2197	Dep.
2632	9-123	Dep.; $0.25
2633	9-305	Dep.; $0.10
2637	9-1671	Phys. Rev. 96, 1549-53(1954)
2652	9-1688	Dep.(mc)
2654	9-2060	Phys. Rev. 97, 117-20(1955)
2662	9-377	Dep.; $0.60
2666	9-107	Chem. Eng. 62, No. 4, 226-30(1955); Dep.; $0.25
2667	9-4328	Superseded by Phys. Rev. 98, 79-84(1955)
2669	9-1633	Phys. Rev. 96, 1568-72(1954)
2671	9-360	Phys. Rev. 96, 541(1954)
2680	9-657	Dep.; $0.25
2681	9-117	Dep.(mc)
2682	9-48	Dep.(mc)
2683	9-59	Dep.; $0.10
2684	9-789	Phys. Rev. 96, 807-9(1954)
2685	9-1993	Phys. Rev. 97, 184-7(1955)
2694	9-60	Dep.(mc)
2695	9-2998	Phys. Rev. 97, 823-30(1955)
2696	9-1480	Dep.(mc); Ind. Dep.
2698	9-3662	Dep.
2699	9-378	Dep.(mc)
2700	9-3652	Phys. Rev. 97, 1305-13(1955)
2704	9-102	Dep.(mc)
2708	9-395	Dep.(mc)
2709	9-61	Dep.(mc)
2710	9-3316	Phys. Rev. 97, 1077-83(1955)
2744	9-735	Dep.(mc)
2745	9-506	Dep.(mc)

Report	Abstract	Availability
UCRL		
2746	9-1689	Dep.(mc)
2748	9-306	Nucleonics 13, No. 3, 44-6(1955); Dep.(mc)
2749	9-3314	Phys. Rev. 97, 1059-70(1955)
2753	9-760	Dep.(mc)
2754	9-736	Dep.(mc)
2768	9-3684	Phys. Rev. 97, 1255-8(1955)
2771	9-1644	Dep.(mc)
2774	9-1456	Dep.(mc)
2779	9-3940	Proc. Soc. Exptl. Biol. Med. 88, 383-6 (1955)
2781	9-2452	Phys. Rev. 97, 564-5(1955)
2783	9-2411	Dep.; $0.25
2790	9-1446	Dep.(mc)
2792	9-1477	Dep.(mc)
2793	9-1709	Proc. Soc. Exptl. Biol. Med. 87, 626-9 (1954)
2794	9-2198	Dep.(mc)
2795	9-2465	Rev. Sci. Instr. 26, 220-8(1955); Dep.(mc)
2798	9-4320	Phys. Rev. 98, 22-3(1955)
2799	9-2914	Dep.
2803	9-2823	J. Phys. Chem. 59, 105-9(1955)
2805	9-2850	Dep.(mc)
2806	9-1645	Dep.(mc)
2812	9-1712	Dep.(mc)
2813	9-1669	Dep.(mc)
2810	9-3663	Dep.
2822	9-3664	Dep.
2823	9-2551	Dep.
2827	9-3377	Dep.
2828	9-2608	Dep.
2832	9-2437	Dep.(mc)
2833	9-2929	Dep.
2836	9-2540	Proc. Soc. Exptl. Biol. Med. 88, 73-5 (1955); Dep.(mc)
2837	9-2195	Dep.
2841	9-2136	Dep.
2843	9-2930	Dep.
2845	9-3364	Dep.
2846	9-3357	Dep.
2853	9-3048	Dep.
2854	9-2137	Dep.
2857	9-3009	Dep.
2858	9-3954	Dep.
2859	9-3089	Dep.(mc); Ind. Dep.
2860	9-2609	Dep.
2862	9-3071	Dep.
2865	9-3253	Dep.
2881	9-3730	Dep.
2920	9-3966	Dep.
2929	9-3778	Dep.
2930	9-4212	Dep.(mc)
4319	9-1320	Nucleonics 12, No. 3, 26-7(1954)
4371	9-4286	Dep.(mc)
4377	9-2634	Dep.
4379	9-4300	Dep.(mc)
4386(Rev.)	9-2021	Phys. Rev. 97, 242(1955)
4400	9-4280	Phys. Rev. 98, 42(1955)
4426	9-2218	Dep.
4432	9-3055	Dep.
UCRL		
4433	9-4025	Dep.
4436	9-2474	Dep.
4459	9-3446	Dep.
4465	9-4246	Dep.(mc)
4474	9-3936	Dep.
UCSF		
10	9-1723	Dep.
UR		
280	9-1731	Arch. Ind. Health 11, 11-16(1955)
307	9-1728	Dep.
308	9-4048	Dep.
310	9-4049	Dep.
327	9-19	Dep.
354	9-481	Dep.
355	9-1157	Dep.
363	9-62	Dep.
365	9-847	Dep.
367	9-916	Dep.
376	9-1705	Dep.
379	9-3010	Dep.
380	9-2521	Dep.
384	9-4050	Dep.
385	9-4045	Dep.
390	9-4076	Dep.
392	9-4055	Dep.
WAPD-ReS		
13	9-429	Dep.(mc)
WAPD-RM		
159	9-2742	Dep.
213	9-779	Dep.; $0.55
WAPD-T		
170	9-1656	Dep.(mc)
WASH		
182	9-659	Dep.; $0.70
183	9-79	Dep.; $0.20
512	9-3098	Dep.
WIN		
7	9-2635	Dep.(mc)
10	9-3779	Dep.(mc)
XDC		
54-4-12	9-2700	See APEX-179
Y		
577	9-1955	Dep.; $0.25
623	9-1956	Dep.; $0.25
628	9-1591	Dep.; $0.25
669	9-1592	Dep.; $0.25
671	9-1957	Dep.; $0.20
692	9-1593	Dep.; $0.25
693	9-1312	Dep.; $0.25
779	9-2406	Dep.; $0.25
813	9-2839	Dep.
958(1953 Suppl.)	9-1961	Dep.

PART II

Report	Abstract	Availability
ACSIL/Liby (British)		
9	9-2237	
AD		
167	9-1529	See ATI-161851
221	9-964	See AD-29006
222	9-965	See AD-29007
223	9-3856	See AD-43830
1292	9-3809	
3245	9-1820	See WADC-TR-52-67
4479	9-3775	
5397	9-3840	
5787	9-3081	
6374	9-2847	
6512	9-2848	
6685	9-3841	
6916	9-4126	
7151	9-4241	
7152	9-4242	
7369	9-2632	See MR-538
8941	9-3842	
9065	9-4215	
9828	9-3922	
9935	9-3069	See MLRR-170
10193	9-3546	
10278	9-3163	
10555	9-3475	
10803	9-3362	See NM-001.059.13.05
10920	9-3407	
11048	9-3476	
11745	9-4243	
12019	9-3868	See WADC-TR-53-84
12123	9-2849	
12451	9-3380	
12978	9-3455	
13619	9-3477	
14076	9-2820	
15741	9-3182	See WADC-TR-52-51(Pt. 2)
15788	9-3051	
15789	9-3207	
15918	9-3478	
15919	9-3479	
15926	9-3518	See WADC-TR-53-101
15991	9-3696	
16020	9-2677	
16225	9-3993	
16317	9-2716	
16386	9-3480	
16551	9-3843	
16978	9-3688	
17020	9-3844	
17410	9-3994	
17929	9-2657	
18056	9-3845	
18061	9-1282	
18652	9-3481	
18993	9-3482	

Report	Abstract	Availability
AD		
19228	9-2717	
19236	9-2895	
19447	9-3483	
19590	9-2412	
19917	9-3968	
21020	9-3846	
21076	9-3847	
22087	9-2718	
22410	9-2825	
22854	9-3848	
22879	9-84	Anal. Chim. Acta 11, 350-6(1954)
22885	9-3484	
22921	9-3394	
22922	9-266	
22977	9-2296	See WADC-TR-53-71
23384	9-3459	See EES-040028B
23385	9-3824	See EES-040009
23431	9-2703	
23498	9-3859	See EES-040029C
23657	9-2238	See WADC-TR-53-184
23715	9-3521	See WADC-TR-53-336(Pt. 1)
24017	9-3519	See WADC-TR-53-151(Suppl. 1)
24308	9-3510	See NAVORD-2072
24476	9-3509	See MR-582
24936	9-2785	
25023	9-2850	See NML-5115-B-19.15(Pt. 3)
25101	9-3485	
25190	9-3622	
25526	9-3865	See RL-1009
25802	9-3849	
25846	9-75	See JPL-PR-20-205
25917	9-3486	
25929	9-3487	
26029	9-3386	See WADC-TR-53-308(Pt. 1.)
26044	9-2273	
26137	9-3488	
26352	9-3869	See WADC-TR-53-274
26498	9-267	
26512	9-2719	
26534	9-3489	
26622	9-3520	See WADC-TR-53-182
26731	9-2274	
26735	9-3490	
26783	9-3164	
27052	9-3491	
27424	9-2945	
27568	9-3872	See YE54-530
27583	9-3522	See WADC-TR-53-451
27589	9-2335	See WADC-TR-53-211
27727	9-3578	See WADC-TR-53-194
27864	9-2720	
28234	9-3889	

Report	Abstract	Availability
AD		
28253	9-1836	
28277	9-3492	
28372	9-3805	
28428	9-3806	
28429	9-2786	
28436	9-947	
28462	9-1527	
28528	9-4204	
28620	9-693	
28641	9-961	
28819	9-962	
28821	9-147	See RIA-54-24
28855	9-167	
28877	9-3165	
28906	9-963	
28937	9-2721	
29006	9-964	
29007	9-965	
29189	9-2130	
29337	9-348	
29379	9-974	See WADC-TR-54-17
29386	9-2740	See WADC-TR-53-190(Pt. 2)
29400	9-4182	See WADC-TR-53-502
29436	9-191	See WADC-TR-52-51(Pt. 3)
29642	9-1237	
29784	9-4107	
30192	9-650	See HE-150-118
30314	9-3493	
30491	9-4226	
30562	9-3873	YE54-541
30732	9-3208	
30744	9-3511	See NOTS-TM-789
30797	9-3850	
30810	9-1738	
31146	9-268	
31564	9-1263	
31826	9-1837	
31854	9-1838	
31954	9-1839	
32009	9-168	
32031	9-1840	
32191	9-1841	
32192	9-1842	
32193	9-1843	
32194	9-1844	
32604	9-1578	
32605	9-1579	
32611	9-1912	
32652	9-3503	See CAL-KB-836-M-6
32731	9-2297	See WADC-TR-53-254(Pt. 1)
32986	9-1845	
33305	9-3216	See PA-TR-1898
33442	9-2722	
33540	9-1846	
33675	9-3494	
33840	9-2275	
33893	9-3720	
34004	9-1789	
34358	9-4157	
34359	9-4158	
34369	9-1847	
34417	9-3523	See WADC-TR-53-88
34434	9-4159	
34449	9-1848	
34485	9-2829	See NP-3822(Add. 1)
34506	9-3814	
34712	9-1849	
34897	9-3115	See RIA-54-849
34924	9-3851	
34974	9-3250	
34999	9-3126	See NAVORD-2958
35043	9-4160	
35044	9-4161	
35044-A	9-3852	
35092	9-3495	
35105	9-3853	
35109	9-3854	
35134	9-3496	
35353	9-4057	
35356	9-4094	
35942	9-4058	
36555	9-4130	See M-TR-10
36788	9-4211	See PIBAL-216
36889	9-2612	
37130	9-4127	
37226	9-4162	
37293	9-4163	
37294	9-4164	
37295	9-4165	
37311	9-4166	
37321	9-4188	See WAL-801/6-25
37702	9-4183	See WADC-TR-53-503
37801	9-4088	
38003	9-4137	
38231	9-4184	See WADC-TR-54-40
38791	9-4143	
38860	9-4299	
40019	9-1808	See RAE-TN-EL-68
40171	9-2381	See CX-14
40234	9-1850	
40252	9-2885	
40272	9-2276	
40736	9-2277	
40737	9-2278	
40917	9-1803	
40935	9-2281	See JPL-PR-20-212
41436	9-2695	See OSR-TN-54-203
41478	9-3855	
41800	9-3497	
41950	9-4041	
42310	9-3795	
42380	9-2299	See WAL-401/216
42465	9-2354	
42466	9-2355	
42467	9-2356	
42468	9-2357	
42694	9-2650	
42703	9-4123	See PI-323
42776	9-3140	
42797	9-3275	See OSR-TN-52-81
43132	9-3547	
43150	9-2160	
43232	9-2279	
43697	9-4168	See COA-84
43739	9-3153	
43830	9-3856	
44180	9-3498	
44196	9-3008	See DTMB-867
44201	9-3500	See AML-NAM-AE-4146
44256	9-3166	
44262	9-3499	
44536	9-3130	See RAE-Trans-476
44543	9-3178	See PA-TR-2061
44577	9-3904	
44599	9-2741	See WADC-TR-53-496
44632	9-3434	
44666	9-3457	See WADC-TR-54-212
44668	9-3345	See AMRL-138

Report	Abstract	Availability
AD		
44719	9-3209	
44789	9-3585	
44790	9-3586	
44846	9-3504	See CAL-KB-836-M-7
44847	9-3502	See CAL-KA-797-M-12
45710	9-3857	
45886	9-3761	
45943	9-4193	See AERE-Trans-11/3/5 253
46020	9-4138	
46196	9-3918	
46197	9-3919	
46232	9-4114	
47751	9-3810	
47919	9-3548	
48094	9-3549	
48846	9-2886	
51362	9-3550	
51831	9-4139	
AECL (Canadian)		
117	9-2405	See CRCE-501
137	9-346	See CRT-566
139	9-812	See CRT-580
146	9-4236	See PDB-95 and Add.
157	9-3667	See CRP-584
165	9-3714	See DL-16
168	9-4037	
AERE-C/M (British)		
103	9-97	
206	9-874	
213	9-74	
215	9-906	
217	9-3789	
220	9-3755	
AERE-C/R (British)		
1274	9-3406	Analyst 80, 225-30(1955)
1359	9-3945	J. Nuclear Energy 1, 214-17(1955)
1388	9-3716	J. Nuclear Energy 1, 173-80(1955)
1458	9-1034	$0.40
1465	9-3402	Analyst 80, 132-40(1955)
1469	9-2219	J. Chem. Soc. (London), 4295-9(1954)
1524	9-4227	$0.90
1534	9-4244	
AERE-ED/R		
1559	9-4128	$0.75
AERE-EL/L (British)		
3	9-294	
6	9-3587	
AERE-EL/M (British)		
10	9-295	
AERE-EL/R (British)		
1350	9-3947	Brit. J. Appl. Phys. 6, 104-6(1955)
1420	9-269	
1536	9-3912	$1.25
AERE-G/M (British)		
76	9-270	$0.65
AERE-GP/R (British)		
1449	9-3920	
1479	9-3962	
1481	9-3818	
AERE-GP/R (British)		
1539	9-3987	
1578	9-4206	
AERE-Inf/Bib (British)		
94	9-1080	
95	9-3551	
AERE-Lib/Trans (British)		
449	9-1868	
452	9-3640	
455	9-3432	
456	9-3766	
457	9-3875	
459	9-4314	
462	9-4225	
463	9-1791	
464	9-1958	
465	9-1869	
468	9-4191	
469	9-3785	
470	9-3374	
471	9-1536	
472	9-4214	
473	9-3448	
474	9-1786	
475	9-3781	
476	9-3429	
477	9-2231	
479	9-4133	
481	9-3361	
485	9-3454	
486	9-1707	
493	9-4077	
495	9-3526	
498	9-1959	
499	9-3449	
500	9-4192	
501	9-1830	
505	9-3552	
506	9-3527	
507	9-3797	
508	9-3421	
509	9-4064	
512	9-4040	
520	9-4093	
AERE-M/M (British)		
22	9-1699	
71	9-3896	Atomics 6, 100-7, 120(1955)
78	9-3776	
AERE-M/R (British)		
606	9-1096	
1256	9-130	Acta Met. 2, 696-712(1954)
1351	9-204	Acta Met. 2, 718-26(1954)
1352	9-1537	Acta Met. 2, 731-42(1954)
1415	9-2662	Radiation Research 2, 96-107(1955)
1470	9-230	
AERE-M/TN (British)		
24	9-170	
25	9-207	Metallurgia 50, 161-5(1954)
AERE-MEMO-EL/M (British)		
11	9-296	

Report	Abstract	Availability
AERE-N/R (British)		
1131	9-297	J. Nuclear Energy 1, 57-75(1954)
AERE-RP/M (British)		
46	9-2445	
47	9-3974	
AERE-RP/R (British)		
1439	9-694	
1330	9-3257	J. Nuclear Energy 1, 110-16(1954)
1331	9-3258	J. Nuclear Energy 1, 117-23(1954)
1511	9-3970	J. Nuclear Energy 1, 234(1955)
AERE-T/M (British)		
113	9-1097	
114	9-3988	
117	9-4265	
AERE-T/R (British)		
1500	9-3963	
1523	9-3964	
AERE-Trans (British)		
11/3/5/253	9-4193	
11/3/5/427	9-118	
11/3/5/430	9-237	
11/3/5/445	9-450	
11/3/5/447	9-641	
AERE-X/M (British)		
134	9-937	
AERE-X/R (British)		
1381	9-3443	
AF-TR		
6516(Pt. 2)	9-1528	
AFSWP		
480	9-234	See USNRDL-417
AML-NAM		
25789(Pt. 2)	9-171	
AML-NAM-AE		
4146	9-3500	
AMRL		
138	9-3345	
149	9-1035	
156	9-1783	
162	9-1710	
168	9-2826	
175	9-4043	
ATI		
58116	9-615	
58193	9-938	
58194	9-616	
9167	9-1851	
103581	9-1894	
110138	9-2828	See NP-3822
171112	9-968	
143770	9-1852	
150135	9-3181	See WADC-TR-52-51(Pt. 1)
153687	9-3129	
154254	9-3167	See CAL-455-M-6
161851	9-1529	
168642	9-3923	See CRLIR-158
169195	9-3726	See NM-001-059.13.04
ATI		
173232	9-1853	
208130	9-1041	See U-13876
208182	9-941	See EES-6C10730
AWRE-O (British)		
14/54	9-2631	
BAM-RI		
5093	9-1895	
5107	9-2724	
5117	9-3858	
BRL-Memo		
819	9-1018	
CAL		
455-M-6	9-3167	
CAL-KA		
797-M-12	9-3502	
CAL-KB		
836-M-6	9-3503	
836-M-7	9-3504	
914-M-2	9-3505	
914-M-3	9-3506	
CCC		
1024-TR-45	9-51	
1024-TR-55	9-98	
1024-TR-58	9-52	
1024-TR-76	9-596	
1024-TR-81	9-2161	
1024-TR-85	9-2131	
1024-TR-86	9-2132	
1024-TR-87	9-2679	
1024-TR-90	9-2613	
1024-TR-93	9-4059	
1024-TR-96	9-3756	
CCL		
5.39	9-4115	
CEA (French)		
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CERN		
55-3	9-3306	
CERN-BS		
16	9-2414	
CERN-PS/ER		
39	9-388	
40	9-3661	
41	9-2495	
CERN-PS/FG		
1	9-1098	
CERN-PS/GL		
13	9-389	

Report	Abstract	Availability
CERN-PS/JBA-MGNH		
23	9-390	
CERN-PS/KJ		
14	9-1099	
16	9-1100	
17	9-1101	
CERN-PS/MM		
5	9-391	
6	9-770	
7	9-1367	
8	9-1652	
9	9-2923	
10	9-4296	
11	9-4297	
CERN/PS/PD		
3	9-3577	
CERN-PS/PL		
1	9-771	
CERN-PS/RGb (British)		
5	9-353	
6	9-392	
7	9-4298	
CERN/T/A-A-B-M		
1	9-2501	
CERN/T/AET		
1	9-2456	
2	9-2457	
3	9-2458	
4	9-2459	
5	9-2460	
CERN/T/ARE		
1	9-2526	
CERN/T/B-F-M		
1	9-2502	
CERN/T/CF		
1	9-2461	
CERN/T/CM		
1	9-2527	
CERN-T/GL		
3	9-2462	
5	9-2528	
CERN/T/JH		
1	9-2433	
CERN/T/KA		
1	9-2529	
CERN/T/LM		
2	9-2530	
CERN/T/NMH		
1	9-2531	
CERN/T/OKH		
1	9-2503	
CERN/T/RH		
1	9-2532	
CERN/T/TS		
2	9-2463	
3	9-2464	
CF (North American Aviation, Inc.)		
1038	9-3450	See NAA-AL-684
COA (British)		
84	9-4168	
CRCE (Canadian)		
501	9-2405	
CRLIR		
158	9-3923	
CRP (Canadian)		
584	9-3667	
CRT (Canadian)		
566	9-346	
580	9-812	
CU		
8-54-SC-42519-Phys.	9-731	See NP-5421
CVAC		
198T	9-2027	
211T	9-2028	
212T	9-2029	
219T	9-2030	
245T	9-2926	
251T	9-1103	
255T	9-3924	
258T	9-1104	
262T	9-3252	
263T	9-1316	
266T	9-1375	
CX		
14	9-2381	
D		
12245	9-4116	
14839	9-4228	
DDC/P (British)		
84	9-3583	See RDB(Cap)/R-8095
103	9-3584	See RDB(Cap)/R-8108
107	9-3570	See RBD(Cap)/TN-127
DL (Canadian)		
16	9-3714	
DRNL-TP		
22	9-1581	
DTMB		
863	9-3439	
867	9-3068	
EES		
040009	9-3824	
040028B	9-3459	
040029C	9-3859	
040038F(3)	9-3145	
040038F(6)	9-3168	

Report	Abstract	Availability
EES		
040358F(B)	9-3169	
080068A	9-1264	
6C101730	9-941	
6C(2)966861	9-3860	
9C(3)966861	9-3507	
9C(4)966861	9-2280	
EMC/P (British)		
34	9-3514	See RDB(W)/TN-166
37	9-3515	See RDB(W)/TN-181
ETF		
760.92-2/Final	9-1802	See NP-5489
760.92-2/3	9-1798	See NP-5485
760.92-2/4	9-1799	See NP-5486
760.92-2/5	9-1800	See NP-5487
760.92-2/6	9-1801	See NP-5488
760-274/Final	9-1964	See NP-5499
F		
2350	9-3174	See NP-5554
F-TS		
713-RE	9-3129	See ATI-153687
8030 A/V	9-4143	See AD-38791
FWE		
10	9-35	
31	9-2415	
G		
17-53	9-3843	See AD-16551
17-62	9-1838	See AD-31854
17-63	9-1847	See AD-34369
GPR (Canadian)		
4/54	9-2260	
HE		
150-118	9-650	
150-124	9-4230	
HEPL		
35	9-3644	
IMM-NYU		
216	9-4238	
ITL		
4135	9-3508	
JENER (Norwegian)		
30	9-697	
31	9-749	Nucleonics 13, No. 2, 72-5(1955)
32	9-3976	Nucleonics 13, No. 5, 70-3(1955)
34	9-3796	
35	9-4235	
JENER-Pub. (Norwegian)		
8	9-899	
JPL-Memo		
20-88	9-4129	
JPL-PR		
20-172	9-630	
20-205	9-75	
20-212	9-2281	

Report	Abstract	Availability
K		
3.3	9-4208	See NP-5578
M-TR		
10	9-4130	
MCC		
1023-TR-34	9-515	
1023-TR-66	9-1763	
1023-TR-67	9-3891	
1023-TR-73	9-516	
1023-TR-75	9-597	
1023-TR-79	9-1741	
1023-TR-80	9-598	
1023-TR-82	9-1742	
1023-TR-98	9-2614	
1023-TR-99	9-2615	
MET.L. (Canadian)		
3	9-2252	
MLCR		
37	9-47	
42	9-53	
43	9-914	
51	9-3359	
53	9-3360	
MLRR		
170	9-3069	
351	9-4054	
MLSR		
2	9-844	
MR		
538	9-2632	
573	9-84	See AD-22879
582	9-3509	
MR-A		
318	9-3030	See CVAC-219T
319	9-1104	See CVAC-258T
336	9-2027	See CVAC-198T
342(Rev.)	9-1103	See CVAC-251T
MR-N		
1	9-2029	See CVAC-212T
5	9-2028	See CVAC-211T
25	9-2926	See CVAC-245T
34	9-3924	See CVAC-255T
47	9-1316	See CVAC-263T
50	9-3253	See CVAC-262T
54	9-1375	See CVAC-266T
NAA-AL		
684	9-3450	
NACA-RM-E		
50F22	9-1248	
52A17	9-1249	
52B06	9-1250	
52D09	9-1251	
52F30	9-1805	
54D13	9-4140	
54H04	9-1105	
54K10	9-4131	
54L10	9-4342	

Report	Abstract	Availability
NACA-TM		
982	9-1818	
1113	9-1014	
1308	9-4134	
NACA-TM		
2717	9-851	
2838	9-4061	
3045	9-4132	
3141	9-3229	
3216	9-4170	
3264	9-2693	
3266	9-2694	
3281	9-2706	
3282	9-3826	
3291	9-173	
3333	9-4142	
3336	9-3125	
3337	9-1813	
3351	9-3863	
3380	9-3171	
3392	9-3915	
NAVORD		
2072	9-3510	
2958	9-3126	
3803	9-1318	
NBS		
2902	9-2076	
3081	9-853	
3130	9-77	
3662	9-698	
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NDA		
10-98	9-2447	
27-39	9-3977	
NEI (Canadian)		
22	9-4171	
NEPA		
1020	9-174	
1798	9-600	
NM		
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006.012.04.67	9-477	
006-012. 04.76	9-3363	
NML		
5115-B-19.15(Pt. 3)	9-2850	
NOTS-TM		
789	9-3511	
NP (AEC File No. for Non AEC Reports)		
1959	9-116	
3822	9-2828	
3822(Add.1)	9-2829	
NP (AEC File No. for Non-AEC Reports)		
4149(2nd Ed., Rev.)	9-2851	
4859(Suppl. 5)	9-1552	
5023	9-55	
5024	9-2134	
5295	9-939	
5295(Suppl. 1)	9-632	
5329	9-13	
5333	9-14	
5336	9-142	
5355	9-175	
5356	9-341	
5358	9-254	Phys. Rev. 97, 1292-1302(1955)
5359	9-255	Phys. Rev. 98, 165-72(1955)(Condensed)
5360	9-289	
5362	9-231	
5364	9-150	
5366	9-15	
5367	9-232	
5368	9-176	
5369	9-177	
5371	9-4	
5372	9-699	
5374	9-178	
5376	9-56	
5377	9-179	
5378	9-517	
5379	9-180	
5400	9-181	
5403	9-182	
5404	9-303	
5405	9-342	
5406	9-393	
5407	9-183	
5408	9-57	
5409	9-184	
5411	9-16	
5412	9-478	
5413	9-479	
5414	9-877	
5415	9-518	
5416	9-519	
5417	9-605	
5418	9-721	
5419	9-480	
5420	9-633	
5421	9-731	
5422	9-634	
5423	9-935	
5424	9-520	
5425	9-521	
5427	9-652	
5429	9-1134	
5431	9-1019	
5432	9-945	
5433	9-948	
5434	9-1139	
5435	9-1071	Phys. Rev. 97, 1191-9(1955) (Condensed)
5439	9-876	
5440	9-1033	
5441	9-890	
5442	9-949	
5443	9-970	
5444	9-1265	
5446	9-1182	

Report	Abstract	Availability
NP (AEC File No. for Non-AEC Reports)		
5447	9-1368	
5448	9-1304	
5449	9-1254	
5450	9-1197	
5452	9-1502	
5454	9-1531	
5470	9-1855	
5471	9-1743	
5472	9-1720	
5473	9-1856	
5474	9-1857	
5475	9-1944	
5477	9-1897	
5478	9-1898	
5479	9-1899	
5480	9-1900	
5481	9-1901	
5482	9-1902	
5483	9-1903	
5484	9-1904	
5485	9-1798	
5486	9-1799	
5487	9-1800	
5488	9-1801	
5489	9-1802	
5490	9-1779	
5491	9-1806	
5492	9-1935	
5493	9-1905	J. Chem. Phys. 23, 409-10(1955) (Condensed)
5494	9-1744	
5495	9-1814	
5496	9-1858	
5497	9-1767	
5499	9-1964	
5500	9-1965	
5501	9-2282	
5502	9-1859	
5503	9-2471	
5504	9-2103	
5505	9-1784	
5506	9-3978	
5507	9-2283	
5508	9-2242	
5509	9-2261	
5510	9-2284	
5511	9-2109	
5513	9-2384	
5514	9-2285	
5515	9-2360	
5516	9-2110	
5518	9-2286	
5519	9-2287	
5520	9-2288	
5521	9-2289	
5522	9-2290	
5523	9-2291	
5524	9-2292	
5526	9-2548	
5527	9-2808	
5528	9-2727	
5529	9-2293	
5530	9-2728	
5531	9-2729	
5532	9-2790	
5533	9-2791	
5534	9-2830	
5535	9-2730	
5538	9-2690	

Report	Abstract	Availability
NP (AEC File No. for Non-AEC Reports)		
5539	9-2731	
5540	9-2732	
5541	9-2733	
5542	9-2792	
5543	9-2549	
5544	9-2852	
5545	9-2707	
5546	9-2853	
5547	9-2913	
5548	9-2928	
5549	9-3172	
5551	9-3083	
5552	9-3173	
5554	9-3174	
5560	9-3175	
5562	9-3146	
5563	9-3382	
5565	9-3008	
5566	9-3214	
5567	9-3408	
5568	9-3383	
5572	9-3176	
5573	9-3588	
5574	9-3589	
5575	9-3512	
5576	9-3930	
5577	9-3931	
5578	9-4208	
5579	9-3989	
5580	9-3758	
5581	9-3759	
5583	9-3827	
5584	9-3727	
5586	9-3728	
5587	9-3729	
5588	9-3717	
5591	9-4062	
5592	9-4332	
5593	9-4172	
5594	9-4209	
5595	9-4091	
5596	9-4264	
5597	9-4173	
5598	9-4108	
5599	9-4174	P. B. 111375; $2.50
5600	9-4141	
5601	9-4175	
5602	9-4118	
5603	9-4119	
5604	9-4176	
5605	9-4063	
5607	9-4177	
5608	9-4120	
5609	9-4121	
5611	9-4178	
5612	9-4318	
5613	9-4122	
5614	9-4179	
5615	9-4333	
5616	9-4210	
5618	9-4239	
NRL (Non-AEC)		
4342	9-1020	
4402	9-1945	
4404	9-1039	

Report	Abstract	Availability
NRL		
4420	9-3894	
4437	9-99	
4447	9-2246	
4453	9-1601	
4459	9-1202	
4467	9-2247	
4478	9-2248	
4483	9-3215	
4506	9-3895	
NRL-Memo		
146	9-1553	
218	9-1554	
387	9-635	
393	9-1466	
OSR-TN		
54-81	9-3275	
54-203	9-2695	
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54-351	9-1815	
55-1	9-1816	
55-4	9-2736	
55-42	9-2092	
55-49	9-3420	
OSR-TR		
54-13	9-186	
P		
2337-8	9-1855	See NP-5470
PA-TR		
1898	9-3216	
1988	9-3513	
2060	9-3452	
2061	9-3178	
PD (Canadian)		
195	9-2473	
PDB (Canadian)		
95 and Add.	9-4236	
128	9-879	
147	9-3248	
PI		
323	9-4123	
PIBAL		
216	9-4211	
PRL		
5.11	9-130	
5.13	9-3123	
PWAC		
101	9-4124	
RAE-TN-EL (British)		
68	9-1808	
RAE-Trans		
476	9-3130	
RDB-(C)/TN (British)		
70	9-1266	

Report	Abstract	Availability
RDB(C)/TN (British)		
86	9-4180	
103	9-2666	
106	9-1745	
117	9-4181	
RDB(Cap)/R (British)		
8095	9-3583	
8108	9-3584	
8120	9-3385	
RDB(Cap)/TN (British)		
127	9-3570	
RDB(R)/TN (British)		
36	9-2822	
RDB(W)/ (British)		
8103	9-3790	
RDB(W)/TN (British)		
58	9-3746	
106	9-3777	
118	9-3933	
119	9-3934	
136	9-3760	
138	9-3815	
166	9-3514	
173	9-3864	
181	9-3515	
197	9-4231	
RIA		
54-24	9-147	
54-849	9-3115	
RL		
1009	9-3865	
RM		
1257(RAND)	9-1	
1285-1(RAND)	9-2590	
1351(RAND)	9-3812	
1359(RAND)	9-3935	
RPR (Australian)		
128	9-2409	
129	9-2410	
S		
4128	9-1197	See NP-5450
13613	9-2790	See NP-5532
13624	9-2791	See NP-5533
S and T Memo (British)		
6/54	9-2737	
13/54	9-2738	
14/54	9-2739	
TAM		
79	9-3453	
TIB/T		
4224	9-196	
TR		
120/54	9-878	See NP-5439
123/54	9-2242	See NP-5508
124/54	9-2261	See NP-5509

Report	Abstract	Availability
TR		
125/54	9-1944	See NP-5475
283-20	9-3081	See AD-5787
TT (Canadian)		
187	9-1930	
221	9-892	
237	9-915	
300	9-1748	
343	9-886	
353	9-1272	
456	9-3239	
471	9-65	
475	9-238	
478	9-239	
479	9-240	
480	9-241	
481	9-66	
483	9-307	
484	9-306	
489	9-1015	
491	9-674	
492	9-683	
499	9-1339	
503	9-1419	
505	9-3557	
506	9-2618	
507	9-2887	
508	9-3571	
509	9-3433	
510	9-3590	
518	9-3572	
U		
10825	9-116	See NP-1959
13876	9-1041	
15991	9-941	See EES-6C101730
22916	9-1267	
63691	9-3508	See ITL-4135
USNRDL		
417	9-234	
USNRDL-TR		
10	9-658	
12	9-482	
14	9-1176	
15	9-1991	
18	9-1447	
19	9-2111	
21	9-3721	
22	9-3937	
23	9-3370	
25	9-3938	
27	9-3385	
28	9-2591	
29	9-4051	
WADC-TR		
52-51(Pt. 1)	9-3181	
52-51(Pt. 2)	9-3182	
52-51(Pt. 3)	9-191	
52-67	9-1820	
52-143	9-1532	
52-145(Pt. 2)	9-3516	
52-145(Pt. 3)	9-3517	

Report	Abstract	Availability
WADC-TR		
52-197(Pt. 1)	9-1487	
53-71	9-2296	
53-84	9-3868	
53-101	9-3518	
53-151 (Suppl. 1)	9-3519	
53-182	9-3520	
53-184	9-2238	
53-190(Pt. 2)	9-2740	
53-194	9-3578	
53-201(Pt. 5)	9-1252	
53-211	9-2335	
53-254(Pt. 1)	9-2297	
53-274	9-3869	
53-308(Pt. 1)	9-3386	
53-336(Pt. 1)	9-3521	
53-451	9-3522	
53-496	9-2741	
53-502	9-4182	
53-503	9-4183	
54-17	9-974	
54-37	9-1817	
54-40	9-4184	
54-88	9-3523	
54-101	9-3524	
54-112	9-1268	
54-120	9-4185	
54-185(Pt. 1)	9-1504	
54-195	9-1269	
54-205	9-2298	
54-212	9-3457	
54-222	9-3870	
54-244	9-975	
54-280	9-4186	
54-294	9-192	
54-295	9-1270	
54-339	9-854	
54-357	9-3871	
54-371	9-976	
54-433	9-3799	
54-616(Pt. 1)	9-3183	
55-30(Pt. 3)	9-2795	
WAL		
120/73	9-4104	
401/65-37	9-1271	
401/68-44	9-977	
401/68-47	9-1533	
401/84-41	9-978	
401/98-37	9-639	
401/203-3	9-1534	
401/214-2	9-4187	
401/216	9-2299	
401/230	9-2386	
801/6-25	9-4188	
821/9	9-1535	
844/18	9-4247	
WIS-ONR		
12	9-235	
YE		
54-530	9-3872	
54-541	9-3873	

ABSTRACTS OF CLASSIFIED REPORTS

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NEW NUCLEAR DATA

The printing of this publication has been approved by
The Director of the Bureau of the Budget, August 3, 1954.

Compiled by the Nuclear Data Group National Research Council

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INTRODUCTION

This issue of Nuclear Science Abstracts contains the semi-annual cumulated list of new nuclear data. Issue 18B will contain the next quarterly list and issue 24B the annual cumulation of all data in the 1955 lists. The 1952, 1953, and 1954 annual cumulations are contained in Vol. 6, No. 24B; Vol. 7, No. 24B; and Vol. 8, No. 24B, respectively, and are available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for $0.25 each. Send check or money order but not stamps.

Nuclear Data Cards: As the current literature is surveyed, the new nuclear results are first printed on 3- by 5-in. cards which are collected into sets of 100 to 150 cards each month. Individuals, laboratories, or libraries may subscribe to the card sets directly by applying to the Publications Office, National Research Council, 2101 Constitution Avenue, N.W., Washington 25, D. C. The price, based on actual mechanical costs, is currently $20 per year domestic and $30 per year foreign (air mail postage included for foreign but not for domestic subscriptions).

The Nuclear Data Group, which is sponsored by the National Research Council, is supported by the U. S. Atomic Energy Commission and the National Bureau of Standards.

CONVENTIONS

All energies are given in Mev and all cross sections in barns unless otherwise stated in the tabular material.

Numerals in italics, following measured values, are the errors (as reported by the authors) in the last figures of the values. In cases where confusion seems possible, the conventional ± is used.

Magnetic moments are reported as before without diamagnetic correction. They are based on $\mu(H) = 2.79267$ and the substandards listed by H. Walchli, ORNL-1469.

In writing reactions, the upper right hand superscript denoting A, the mass number of the target nucleus, is given without parentheses when the target was monoisotopic or when enriched (or depleted) material was used to establish the identity of the reacting isotope. It is given in parentheses when natural material was used but when the identity of the reacting isotope was strongly suggested by its predominating abundance, the observed reaction energy, or the activity or yield of the end product. It is given in parentheses with a question mark when the target A was assigned by systematics, elimination, etc. For instance, "$B^{10}(d,p)$" means that the proton groups from the deuteron bombardment of B^{10} were identified by

comparing effects in B^{10} enriched and natural B samples. "B^{11}(d,p)" means that the assignment to B^{11} was made by using B^{11} depleted and natural B samples. "$C^{(12)}$(d,p)" means that natural C was used to study the reaction, but, because of the 99% abundance of C^{12}, the reaction observed was assumed to take place in that isotope. In the reaction "$Sn^{(116)}$(n,p)$13^{s}In$", the Sn isotope was identified by the In product. "$Te^{(125?)}$ (d,p)$Te^{(126?)}$" indicates that from the trend of Q values in the region, the experimenters believed that their measured Q most likely belonged to the indicated reaction.

When a method of production of a radioactive nucleus is given, the lowest bombarding energy used by the experimenter is indicated; e.g., Ag(20-Mev p).

The large black dots on the decay schemes are used to indicate experimentally established coincidences. α, β, or γ rays entering a level and dotted at their arrowheads have been shown to be in coincidence with gamma rays leaving the same level and dotted at their origins. In case of a simple cascade, the dots of the incoming and outgoing rays are superimposed. Dashes are used for doubtful radiations or levels.

For the light nuclei, energy levels in the compound nucleus are usually tabulated rather than the resonant energy of the bombarding particle. The binding energy of the bombarding particle in the compound nucleus is taken from the table of F. Ajzenberg, T. Lauritsen, Revs. Modern Phys. 27, 77(1955) for $Z<11$, and from P. M. Endt, J. C. Kluyver, Revs. Modern Phys. 26, 95(1954) for Z from 11 to 20.

In 1954, nuclear data, reported at meetings of the American Physical Society, were not tabulated until Physical Review references for the abstracts were available. This year, they will be reported more promptly with references to the Bulletin of the American Physical Society, BAPS, and to the volume number of the Physical Review in which the Bulletin will later be reprinted.

ABBREVIATIONS

a	absorption
a $\beta\gamma$	absorption of β's in coincidence with γ's
a ce	absorption of conversion electrons
a coin	absorption of photoelectrons between counters in coincidence
α	total γ-ray conversion coefficient, N_e/N_γ
$\alpha_K, \alpha_L, \ldots$	γ-ray conversion coefficient for electrons ejected from the K, L, ... shell
$\alpha_0, \alpha_1, \ldots$	α to g.s., first excited state, ... of residual nucleus
B	band spectra method
B(E2)	reduced E2 excitation probability in barns^2 (upward transition)
Be(γ,n)	measurement by detection of photoneutrons from Be
B_n, B_p	neutron, proton binding energy, i.e., energy necessary to remove particle from nucleus
$\beta\gamma(\theta)$	angular correlation of β's and γ's in coincidence
calc	calculated from experimental work reported elsewhere
cc	cloud chamber
CcW	Cockcroft Walton accelerator
ce	conversion electrons
chem	chemical separation of product following reaction
Cp	Compton electrons
cryst	crystal spectrometer
d	(1) deuteron, (2) descendant of, (3) days, when used as superscript
d,p(θ)	angular distribution of protons with respect to deuteron beam
D(γ,n), D(γ,p)	measurement by detection of photoneutrons or photoprotons from deuterium
$\bar{E}$	average energy
E_0	resonance energy
$E_\beta, E_\gamma, \ldots$	energy of β ray, energy of γ ray, ...
E_{dis}	disintegration energy
EA	electrostatic analyzer
E1, E2, ...	electric dipole, electric quadrupole, ...
e_A	Auger electron
el	elastic scattering
ϵ	(1) electron capture, (2) fractional transition probability for decay process observed
ϵ_K, ϵ_L	electron capture from K, L shell
$\eta(\theta)$	$[W(\theta) - W(\pi/2)]/W(\pi/2)$, a measure of asymmetry in angular distributions, where $W(\theta)$ is the count at angle θ
f	fission, in abbreviations for methods of production or detection
F-K	Fermi-Kurie β energy distribution plot

$\gamma(\theta,T)$	numbers of γ's as function of angle and temperature
$\gamma\gamma$, $\beta\gamma$, $\alpha\gamma$, $n\gamma$	$\gamma\gamma$, $\beta\gamma$, $\alpha\gamma$, or $n\gamma$ coincidences. (0.123 γ) (0.246 γ, 0.325 γ) means 0.123 γ in coincidence with 0.246 γ and 0.325 γ
g	gyromagnetic ratio
$\gamma^{\pm}$	annihilation radiation
Γ	resonance half-width (the whole width at half-maximum)
GM	Geiger-Müller counter
g.s.	ground state
I	(1) nuclear induction magnetic resonance method
IB	internal bremsstrahlung
ic	ionization chamber
IT	isomeric transition
J	spin in units $h/2\pi$
K/L	α_K/α_L
l	angular momentum of particle absorbed into or picked up from nucleus
Lin	linear accelerator
M	molecular or atomic beam resonance method
m	medium intensity
M1, M2, ...	magnetic dipole, magnetic quadrupole, ...
mb	millibarns
Mic	microwave method
mir	measurement by total reflection of neutron beam from mirror surface
ms	mass spectrometer
μ	(1) magnetic moment in units of nuclear magnetons, (2) micron, 10^{-4} cm
μ_3	magnetic octupole moment in units of nuclear magneton barns
μs	microseconds
ν	neutrino
osc	pile oscillator method
p	(1) proton, (2) predecessor of
pr	electron-positron pair
p res	proton resonance. Magnetic field standardized by means of proton resonance frequency
para	paramagnetic resonance method
parentheses	parentheses are put around values which are given for identification purposes
pc	proportional counter
pe	photoelectrons
ppl	photoplates or emulsions
primes	primes indicate inelastically scattered particles
q	electric quadrupole moment in units of barns
quad res	quadrupole resonance method
Q	reaction energy in Mev
s	(1) spectrometer method, (2) seconds, when used as superscript
s coh	coherent scattering
S	atomic spectra measurement
scin	1 crystal scintillation counter
scin Cp	2 crystal scintillation counter
scin pr	3 crystal scintillation counter
sd	double focusing spectrometer
sl	lens spectrometer
sl ce	conversion electrons measured in lens spectrometer
st	strong
sπ	180° spectrometer
sπ pr	180° pair spectrometer
σ	cross section in barns
σ_0	cross section at resonance energy, E_0
σ_a	absorption cross section
σ_t	total cross section
Σ scin	scintillation counter used to sum energy of transitions in cascade
t	(1) triton, H^3, (2) total cross section when used under σ in cross section list
trans	transmission
T	(1) isotopic spin; (2) temperature
τ	half life in units indicated
τ_1, τ_2	half life of upper, lower state
$\tau_{\beta\beta}, \tau_{\epsilon\epsilon}$	half life for double β, double ϵ decay
τ_γ(E2)	partial half-life for de-excitation by E2 γ transition (downward transition)
th	thermal
VdG	Van de Graaff accelerator
w, vw	weak, very weak
$Y_\gamma, Y_p, \ldots$	yield of γ rays, yield of protons, ...
%	% of disintegrations
†	relative numbers. When used in connection with γ rays, relative numbers of photons, not photons plus conversion electrons, are meant
+,–	even, odd parity when used in connection with level properties

Standard journal abbreviations are used.

RADIOACTIVITY, LEVELS, ABUNDANCES, MOMENTS,

Unassigned activities from proton bombardment

τ (sec)	Target	E_p
0.4	Mg	50
4.5	Mg	80
~0.2	Al^{27}	80
~2.5	Si	20
~1	Si	50
0.2	Ti	80
0.77	Mn^{55}	95
0.55	Fe	50
0.3	Cu	130
1.3	Cu	130
0.15	Zn	100
0.8	Zn	100

H.Tyrén, P.A.Tove, Phys. Rev. 96,773(1954).

ν μ $< 10^{-7}$
From counting rate in large liquid scintillator near reactor

C.L.Cowan, Jr., F.Reines, F.B.Harrison, Phys. Rev. 96, 1294 (1954).

$n^1_{0\ 1}$ $^{13^m}$ J 1/2 M
Direct measurement with neutron beam

C.P.Stanford, T.E.Stephenson, S.Bernstein, Phys. Rev. 96, 983 (1954).

$H^1_{1\ 0}$ stable τ $> 10^{21}$y
From pulse rate in large scintillator of C_7H_8 with 100 ft of rock shielding
τ for bound p $> 10^{22}$ y

F.Reines, C.L.Cowan, Jr., M.Goldhaber, Phys. Rev. 96, 1157 (1954).

$He^3_{2\ 2}$ stable H^2(d,p) E_d = 190
H^2(d,n) H^3,He^3 detected
$\sigma(H^3)/\sigma(He^3) = 0.86 \pm 0.14$ at 30° c.m.

C.S.Godfrey, Phys. Rev. 96, 1621 (1954).

He^4 (γ,p) $E_\gamma \leq 20$ to ≤ 40
σ curve shows max (~1.8 mb) at E_γ ~26
$\int \sigma\, dE = 0.016$ Mev barns
p,$\gamma(\theta)$ has cos θ term ppl

E.G.Fuller, Phys. Rev. 96, 1306 (1954); Phys. Rev. 83, 202A (1951).

$He^3_{2\ 2}$ stable H^2(d,p) E_d = 0.15 to 0.45
H^2(d,n) H^3,He^3 detected, pc
$\sigma(H^3)/\sigma(He^3) < 1$ Ratio decreases with E_d
d,n(θ) more asymmetric than d,p(θ)

G.Preston, F.F.D.Shaw, S.A.Young, Proc. Roy. Soc. 226A, 206 (1954).

$He^5_{2\ 3}$ $\sim 10^{-21}$s Levels He^4(n,n) E_n = 14.3 cc
n,$\alpha(\theta)$ results for θ = 20° to 90° agree with Dodder, Gammel curve

D.F.Shaw, Proc. Phys. Soc. 68A, 43 (1955).

Levels Li^6(t,α) E_t = 0.24
g.s.
other ? s, pc

K.W.Allen, E.Almqvist, J.T.Dewan, T.P.Pepper, Phys. Rev. 96, 684 (1954).

$He^6_{2\ 4}$ 0.83^s τ 0.799^S 3 Li^7 ($\leq$ 65-Mev γ,p)

R.M.Kline, D.J.Zaffarano, Phys. Rev. 96, 1620 (1954).

τ 0.85^S 3 Be^9(pile n,α) chem
β,$Li^6(\theta)$ gives $-0.5 < G_A/G_T < +0.3$, $\therefore G_A \sim 0$

B.M.Rustad, S.L.Ruby, Phys. Rev. 97, 991 (1955).

Levels Li^7(t,α) E_t = 0.24
1† g.s. $J = 0^+$ t,$\alpha(\theta)$
8† (1.71) $J = 2^+$

E.Almqvist, T.P.Pepper, P.Lorrain, Can. J. Phys 32, 621 (1954).

Levels Li^7(t,α) E_t = 0.24 pc
g.s Q = 9.79 ± 0.03
1.71 1 $\Gamma < 0.1$?
3.35* ?
*From α's observed at backward angles only

K.W.Allen, E.Almqvist, J.T.Dewan, T.P.Pepper, Phys. Rev. 96, 684 (1954).

He^6 (2 4, 0.83 s)

Levels $Li^7(t,\alpha)$ $E_t = 0.9$
1.71 $\Gamma < 0.1$
3.4 ? $\Gamma < 0.3$

K.W.Allen, E.Almqvist, C.B.Bigham, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), K2(1955).

Li (3)

Abundances
Li^6 7.98% $Li^7/Li^6 = 11.53 \pm 0.29$
Li^7 92.02%
From crystal density and x ray data

D.A.Hutchison, Phys. Rev. 96, 1018 (1954).

Li^8? (3 1)

τ $\sim 0.4^s$ Li(50-Mev p)
See also Be^6 Be^9(50-Mev p)

H.Tyrén, P.A.Tove, Phys. Rev. 96, 773(1954).

Li^5 (3 2)

$He^4(p,p)$ $E_p = 9.73$ scin
Graph of $p,p(\theta)$ disagrees with Putnam's

B.Cork, W.Hartsough, Phys. Rev. 96,1267(1954).

$He^4(p,p)$ $E_p = 9.76$ ppl
Data for $p,p(\theta)$ agree with Putnam's

J.M.Williams, S.W.Rasmussen, Phys. Rev. 98 (1955);
BAPS 30, #1 (New York), L3.

Level $Li^6(p,d)$ $E_p = 18.6$ pc,scin
g.s. $Q = -3.0$ 2 $\Gamma \sim 1.8$
$l_n = 1$ $p,d(\theta)$
g.s. group asymmetric on low energy side. No other level found up to 6.5

J.G.Likely, Phys. Rev.98 (1955).
BAPS. 30, #2 (Baltimore) G6.

Level $He^3(d,\gamma)$ $E_d = 0.2$ to 2.85
γ 16.6 2 $\Gamma_\gamma = 11$ ev
$E_o = 0.45$ 4 $\sigma_o = 0.6$
$d,\gamma(\theta) \sim$ isotropic at $E_d = 0.58$

J.M.Blair, H.M.Hintz, D.M.Van Patter, Phys. Rev. 96, 1023 (1954).

Level $H^2(He^3,p)$ $E_{He^3} = 0.1$ to 0.8
16.8 3 pc,scin
$He^3,p(\theta)$ isotropic for $E_{He^3} = 0.20, 0.29, 0.35$
$\sigma_{max} = 0.70$ for $E_{He^3} = 0.640$
Resonance in this and $H^2(H^3,p)$ reaction can be fitted with ~same parameters if J = 3/2+ is assumed for both.

W.E.Kunz, Phys. Rev. 97, 456 (1955).

Li^6 (3 3, stable)

$n,p(\theta)$ $Li^6(n,p)$ $E_n \approx 14$ ppl
$n,d(\theta)$ $Li^6(n,d)$
$n,t(\theta)$ $Li^6(n,t)$

G.M.Frye, Jr., Phys. Rev. 93, 1086 (1954).

$n,t(\theta)$ $Li^6(n,t)$ $E_n = 1.1, 1.5, 2.0$ ppl

J.B.Waddell, J.M.Roberts, Phys. Rev. 95, 117 (1954).

Level $Li^6(p,d)$ $E_p = 18.6$ pc,scin
g.s. $l_n = 1$ $p,d(\theta)$

J.G.Likely, Phys. Rev. 98 (1955)
BAPS 30, #2 (Baltimore), G6.

Levels $Li^7(He^3,\alpha)$ $E_{He^3} = 0.9$

Level	Γ	Level	Γ
2.18	<0.1	6.63 *8*	<0.2
3.56 *6**	<0.1	7.40 *10*	0.6
4.3 *2*	?	8.37 *8* ?	<0.2
5.35 *7*	<0.1	9.3 *2* ?	0.6
5.6 *2* ?	2.0		

*Recoil Li^6 ions show this level emits γ's

K.W.Allen, E.Almqvist, C.B.Bigham, Phys. Rev. 99 (1955); BAPS 30, #3(Washington), K2(1955).

Li^7 (3 4, stable)

Not observed $Li^7(n,p)$ $E_n = 14$ ppl
Observed $Li^7(n,d)$
$n,t(\theta)$ $Li^7(n,t)$

G.M.Frye, Jr., Phys. Rev. 96 1086 (1954).

Level $Li^{(7)}(\alpha,\alpha'\gamma)$ $E_\alpha = 1.9$ scin
(0.478)
$\tau < 3 \times 10^{-13}$ s from Doppler shift of γ
$\alpha\gamma(\theta)$ isotropic within 10%

C.W.Li, R.Sherr, Phys. Rev. 96, 389 (1954).

Level $Li^{(7)}(\alpha,\alpha'\gamma)$ $E_\alpha = 5.30$ sl
0.478 2
$\tau < 1.3 \times 10^{-13}$ s from Doppler shift of γ

V.S.Zhlpinel, Izvest. Akad. Nauk Ser. Fiz. SSSR 18, 65 (1954).

Levels $Li^{(7)}(\gamma,\alpha)$ $E_\gamma \leq 31$ ppl
4.7 *1* J = 5/2 $\gamma,\alpha(\theta)$
5.5 *1* J = 5/2 (3/2, 1/2 ?)
6.8 *1* J = 5/2 (3/2, 1/2 ?)
Possible levels at 7.4, 8.3, 9.0
$\sigma(E_\gamma = 4.7) \sim 0.15$ mb

P.Stoll, Helv. Phys. Acta 27, 395 (1954).
P.Erdös, P.Stoll, M.Wächter, V.Wataghin, Nuovo Cim. 12, 639 (1954).

$Li^7_{3\ 4}$ stable

Level $Li^6(n)$ E_n = 0.035 to 4.2
7.46 E_o = 0.26 *1* σ_o = 10.3
$J = 5/2^-$ $\Gamma_\alpha = 0.06, \Gamma_n = 0.114$

C.H.Johnson, M.B.Willard, J.K.Bair, Phys. Rev. 96, 985 (1954).

$Li^8_{3\ 5}$ 0.84^s

τ 0.841^{s} 4 $Be^9(\leq 65\text{-Mev}\ \gamma, p)$

R.W.Kline, D.J.Zaffarano, Phys. Rev. 96,1620 (1954).

E_n = 0.4 to 1.7
Level $Li^{(7)}(n, n' + 0.478\gamma)$
3.22 Γ = 1.14 scin
$\sigma(E_n)$ fitted assuming either $J = 1^+$ or 1^-

J.M.Freeman, A.M.Lane, B.Rose, Phil. Mag. 46, 17 (1955).

$Li^9_{3\ 6}$ 0.17^s

$U^{235}(\gamma, f)$ $E_\gamma \leq 11$
$8 \pm 2\times10^{-5}$ delayed n's per fission with
$\tau = 0.15 \pm 0.04^s$ tentatively assigned here

P.J.Bendt, F.R.Scott, Phys. Rev. 97, 744(1955).

$Be^6_{4\ 2}$?

τ $\sim 0.4^s$ Li(50-Mev p)
See also Li^6 Be(50-Mev p)

H.Tyrén, P. A.Tove, Phys. Rev. 96, 773(1954).

$Be^8_{4\ 4}$ $\sim 10^{-16}s$

$Li^6(d,t)$ E_d = 0.4 to 5.5
$\sigma(E_d \sim 1) = 0.19$, $\sigma(E_d \sim 4) = 0.29$

R.L.Macklin, N.E.Banta, Phys. Rev. 97, 753 (1955); 95, 302A (1954).

Level $B^{(11)}(p,\alpha_1)2\alpha_2$ E_p = 0.163
g.s. Q(break-up) = 0.090 *5*
$\alpha_1, \sigma_2(\theta)$ $\tau < 4\times10^{-15}s$ $J = 0$

F.B.Treacy, Proc. Phys. Soc. 68A, 204(1955).

Level $Li^{(7)}(p,\gamma)$ E_p = 1.5 to 5
19.1 Γ = 0.4 scin ($E_\gamma > 10$)

C.P.Swann, M.A.Rothman, W.C.Porter, C.E.Mandeville, Phys. Rev. 98 (1955). BAPS 30, #1(New York), RA1.

Levels $Li^{(7)}(p,n)$
(19.2) $J = 3^+$, $T = 1$
Background due to $J = 1^-$ and $J = 2^-, T = 0$ states
Conclusions from analysis of available data

R.K.Adair, Phys. Rev. 96, 769 (1954).

$Be^9_{4\ 5}$ stable

$Be^9(n, ?\gamma)$ E_n = 3.2 scin
No γ's observed

V.E.Scherrer, B.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

Levels $Li^7(He^3,p)$ E_{He^3} = 0.72 scin
g.s.
1.8 *2*
2.4 *2*
3.2 *1*
4.0 *1*
p's distinguished from d's by absorption

C.D.Moak, W.M.Good, W.E.Kunz, Phys. Rev. 96, 1363; 95, 640A (1954).

Levels $Be^9(p,p')$ E_p = 3 to 6.5 a
g.s.
2.43 *5*
Graph of $d\sigma/d\omega(90°)$ given

G.W.Greenlees, Proc. Phys. Soc. 68A, 97(1955).

Levels $Li^7(He^3,p)$ E_{He^3} = 0.9

Level	Γ	Level	Γ
1.81 *1*	<0.4	3.06 *s*	<0.3
2.39 *s*	<0.2	4.74 *s*	1.2
		9.27	1.2

$B^{10}(t,\alpha)$ E_t = 0.9
2.39
3.06

E.Almqvist, K.W.Allen, C.B.Bigham, Phys. Rev. 99(1955); BAPS 30, #3(Washington), K3(1955).

Level? $Li^7(d,t)$ E_d = 1.3 to 5.5
~18.6?
$\sigma(E_d \sim 2.4) = 0.095$, $\sigma(E_d \sim 4) = 0.165$

R.L.Macklin, N.E.Banta, Phys. Rev. 97, 753 (1955).

$Be^{10}_{4\ 6}$ $2.5\times10^{6}y$

Levels $Be^9(d,p)$ E_d = 11.9
g.s. $l_n = 1$ d,p(θ)
(3.37) $l_n = 1$

F.S.Eby, Phys. Rev. 96, 1355 (1954).

Levels $Be^9(d,p)$ E_d = 6.4 to 7.4
g.s. Q = 4.586 *9* 37 90°
3.37 *1* st 6.26 *1*
5.96 *1* 7.37 $\Gamma \sim 0.025$
W 6.18 *1* 7.54 $\Gamma \sim 0.010$

J.J.Jung, C.K.Bockelman, Phys. Rev. 96, 1353 (1954); Phys. Rev. 94, 748A (1954).

Be^{10} 4 6 2.5×10^6y

Levels $Li^{(7)}(t,\alpha)$ $E_t = 0.24$
~17.4 $J = 2^+, 2^-$ levels $t,\alpha(\theta)$

E.Almqvist, T.P.Pepper, P.Lorrain, Can. J. Phys. 32, 621 (1954).

B 5

γ $B(n,?\gamma)$ $E_n = 3.2$ scin
st 0.43 1.41
0.76 1.61
1.02 2.0
1.17

V.E.Scherrer, S.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

B^9 5 4

Level $B^{10}(He^3,\alpha)$ $E_{He^3} = 0.9$
2.58 *13*

E.Almqvist, K.W.Allen, C.B.Bigham, Phys. Rev. 99(1955); BAPS 30, #3(Washington), K3(1955).

B^{11} 5 6 stable

Levels $B^{10}(d,p)$ $E_d = 0.18, 0.29, 0.41, 0.58$

		l_n	
6.4†	g.s	1	ppl; scin
1.8†	(2.14)	3	$d,p(\theta)$
7.1†	(4.46)	0	
1.3†	(5.03)	2	

†$\int d\sigma$ in mb at $E_d = 0.58$. σ's given at other E_d
$d,p(\theta)$ analyzed for stripping and compound nucleus formation

C.M.Paris, F.P.G.Valckx, P.M.Endt, Physica 20, 573 (1954).

Levels $B^{10}(d,p)$ $E_d = 3.90$ $d,p(\theta)$

g.s.	$l_n = 1$
(2.14)	~isotropic*
(4.46)	$l_n = 1$
(5.03)	~isotropic*
(6.76)	$l_n = 1$

S.A.Cox, R.M.Williamson, Phys. Rev. 99(1955); BAPS 30, #3(Washington), K4(1955); *verbal report.

Levels $Li^{(7)}(\alpha,\alpha'+0.478\,\gamma)$ $E_\alpha \leq 2.8$

0.11†	9.86	$\Gamma = 0.125$	$J \leq 5/2$ if −
			$J \leq 3/2$ if +
0.08†	10.23	$\Gamma \sim 0.155$	$J \leq 7/2$

No 10.32 level (< 0.008†)
Correction made for barrier penetration
J from comparison of reduced width with limit
†Peak cross section in barns

C.W.Li, R.Sherr, Phys. Rev. 96, 389 (1954).

B^{12} 5 7 0.03s

γ $B^{(11)}(d,p\gamma)$ $E_d = 1.05$ scin

2†	0.960
1†	1.64

L.C.Thompson, Phys. Rev. 96, 369 (1954).

C^{11} 6 5 20.4m

Levels $B^{10}(d,n)$ $E_d = 0.58$ ppl $d,n(\theta)$

		l_p
2.0†	g.s.	1
0.8†	(1.85)	3?
2.2†	(4.23)	0
0.7†	(4.77)	

†$\int d\sigma$ in mb
$d,n(\theta)$ analyzed for stripping and compound nucleus formation

C.M.Paris, P.M.Endt, Physica 20, 585(1954).

Level $B^{10}(p,\gamma)$ $E_p = 0.78$ to 1.72
8.77 # $\Gamma = 0.57$ scin ($E_\gamma \sim 9.7$)
No resonances at $E_p = 0.78, 0.95, 1.33$

T.M.Hahn, Jr., S.D.Kern, G.K.Farney, Phys. Rev. 98 (1955).
BAPS 30, #1(New York), RA2.

C^{12} 6 6 stable

Levels $C^{(12)}(p,p')$ $E_p = 9.9$

g.s.	$p,p(\theta)$*
(4.43)	$p,p'(\theta)$**

*Diffraction effects observed
**Analyzed for direct collision and compound nucleus formation

G.E.Fischer, Phys. Rev. 96, 704 (1954).

Levels $B^{(11)}(d,n)$ $E_d = 1.8$ to 4.7
g.s. pc scin
(4.43)
$d,n(\theta)$ varies markedly with E_d

J.R.Risser, J.Price, C.M.Class, Phys. Rev. 93, (1955).
BAPS 30, #1 (New York), RA3.

Levels $C^{(12)}(p,p')$ $E_p = 8.5$ ppl
g.s. $\sigma(\theta)$ has a max. at 100°
(4.43) σ symmetric about 90°

W.E.Burcham, W.M.Gibson, A.Hossain, J.Rotblat, Phys. Rev. 92, 1266 (1953).

Levels $C^{(12)}(p,p')$ $E_p = 14$ to 19
g.s.
(4.43) σ asymmetric about 90°
(7.65)
(9.61)
$p,p'(\theta)$ does not fit direct interaction picture

R.Peelle, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), RA4.

NRC 55P02 55-3-12

Levels $C^{(12)}(d,d')$ $E_d = 19$ ppl
g.s.
(4.43)
(9.61)
Group to level at 7.68 not observed
Graphs of $\sigma(\theta)$ given but not analyzed

R.G.Freemantle, W.M.Gibson, J.Rotblat, Phil. Mag. 45, 1200 (1954).

C^{12} 6 6 stable

Levels $B^{11}(d,n)$ $E_d = 0.85$ ppl d,n(θ)

	l_p
g.s.	1,2?
4.4	1
7.7	isotropic within 25%
9.6	2
12.7	

A.Graue, Phil. Mag. 45, 1205 (1954).

Levels $B^{10}(He^3,p)$ $E_{He^3} = 0.9$ ppl

		scin
4.43 ±	13.31 ±	
7.77 ±	13.97 ±	
9.61 ±	15.10 ±	
10.75 ±	16.04 ±	
11.83 ±	16.57 ±	
12.76 ±		

C.B.Bigham, K.W.Allen, E.Almqvist, Phys. Rev. 99(1955); BAPS 30, #3(Washington), K5(1955).

Levels $C^{(12)}(e,e')$ $E_e = 150$ to 188

4.4
7.7
9.7

Resolution 0.2%

J.M.Fregeau, R.Hofstadter, Phys. Rev. 98 (1955).
BAPS 30, #1(New York), RA6.

Level $N^{(14)}(d,\alpha\gamma\gamma)$ $E_d = 0.63$ scin

(7.65)

$(3.2\gamma)(4.4\gamma)(\theta)$ consistent with J = 0, 2, 0

J.Seed, Phil. Mag. 46, 100 (1955).

Levels $C^{(12)}(p,p'3\alpha)$ cc

9.6	20
11.8	25
16	

1/4 events via Be^8 g.s; 1/2 via Be^8 2.9 level

J.L.Need, Phys. Rev. 98, (1955).
BAPS 30, #2 (Baltimore), G7.

γ $B^{(11)}(d,n\gamma)$ $E_d = 10.8$ scin

100† 15.1

$N^{(14)}(d,\alpha\gamma)$ $E_d = 10.8$

3† ~15

$Be^9(\alpha,n\gamma)$ $E_\alpha = 21.7$

6† ~15

Results consistent with assignment of T = 1, J = 1⁺ state to C^{12}

V.K.Rasmussen, J.R.Rees, W.B.Sampson, N.S.Wall Phys. Rev. 96, 812 (1954).

C^{12} 6 6 stable

γ $C^{(12)}(p,p'\gamma)^*$ $E_p = 30$ to 340
$B^{11}(d,n\gamma)$ $E_d = 18$ to 50

15.2 2 From T = 1 level? s pr

*σ(15.2-Mev γ) at 90° given
γ not produced by B^{10}(d), Be(p), B(p), O(p) for above E_d and E_p nor by Be(170-Mev α)

D.Cohen, B.J.Moyer, H.Shaw, C.Waddell, Phys. Rev. 96, 714 (1954).

Levels $B^{(11)}(p,\gamma)$ $E_p = 0.6$ to 2.0

(16.10)	(18.39)
(17.22)	(19.25)

D_γ(12-Mev γ)(θ); D_γ(16-Mev γ)(θ) as f(E_p) show that more than two of above levels are involved in interference scin

H.H.Givin, G.K.Farney, T.W.Hahn, B.D.Kern, Phys. Rev. 96, 1337; 95, 302A, 641A (1954).

Levels $B^{(11)}(p,\gamma)$ $E_p = 0.5$ to 3.0

16.56 ~16 γ not resonant
p(~12 γ)(θ) gives J = 2⁻, 3⁺
17.2 p(~16 γ)(θ) gives J = 1⁻, 2⁺
p(~12 γ)(θ) large cos term
18.4 p(~16 γ)(θ) gives J = 2⁺
Both γ's weakly resonant

M.E.Gove, E.B.Paul, Phys. Rev. 97, 104(1955).

Level $B^{10}(d,p)$ $E_d = 0.15$ to 0.7

25.36 scin

Irregularities in relative intensities of four longest p groups observed at $E_d = 0.21$

C.H.Paris, F.P.O.Vaickx, P.M.Endt, Physica 20, 373 (1954).

C^{13} 6 7 stable

J 1/2 I

μ 0.702198

$\nu(C^{13})/\nu(H^1) = 0.2514431$ 5

Both nuclei in same molecule

V.Royden, Phys. Rev. 96, 543 (1954).

$C^{(12)}(d,p)$ $E_d = 0.52$ to 0.84

g.s. ppl

Values of $a_1 \ldots a_4$ in $\Sigma a_l P_l(\theta)$ for d,p(θ)

S.Takemoto, T.Dazai, R.Chiba, S.Ito, S.Suganomata, Z.Watanabe, J. Phys. Soc. Japan 9, 447 (1954).

Levels $C^{(12)}(d,p)$ $E_d = 7.00$

g.s. Q = 2.717 10 ∫ 90°
3.090
3.684 } Δ Q = 0.170 ± 0.003
3.855 }

No 0.70, 4.6 level found (< 0.5% of g.s.)

A.Sperduto, W.W.Buechner, C.K.Bockelman, C.P.Browne, Phys. Rev. 96, 1316 (1954).

C^{13} 6 7 stable

Levels $C^{(12)}(d,p)$ $E_d = 19$ ppl d,p(θ)

	l_n
g.s.	1?
(3.08)	0
(3.89)	2

R.G.Freemantle, W.W.Gibson, J.Rotblat, Phil. Mag. 45, 1200 (1954).

Levels $B^{11}(He^3,p)$ $E_{He^3} = 0.9$ ppl

3.08 6	8.96 6	scin
3.77 6	10.00 6	
6.89 6	10.99 6	
7.63 6	11.76 6	

C.B.Bigham, K.W.Allen, E.Almqvist, Phys. Rev. 99(1955); BAPS 30, #3(Washington), K5(1955).

Level $C^{(12)}(d,p)$ $E_d \sim 2.74$

(3.09)

d,p(θ) studied. Large σ at 180°

M.T.McEllistrem, R.Chiba, R.A.Douglas, D.F. Herring, E.A.Silverstein, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), K9(1955).

Level $C^{(12)}(d,p)$ $E_d = 1.2$

γ (3.09) E1 $e^+e^-(\theta)$ scin

S.Gorodetzky, R.Armbruster, P.Chevallier, A.Gallmann, Compt. rend. 239, 1623 (1954).

Levels $C^{(12)}(n,n)$ $E_n = 1.9$ to 3.9

6.84	$J = 3/2^+ (5/2^+?)$	n,n(θ)
7.67	$J = 3/2^+$	
8.29	$J = 3/2^+$	

Old results corrected and extended
Phase analyses use σ_t and polarization

P.Huber, R.Budde, Helv. Phys. Acta 27, 512A (1954).

Levels $C^{12}(d,p)$ $E_d = 14.5$ s

7.53 2		9.50 2
7.64 2	$\Gamma > 0.1$	9.90 2

J.N.McGruer, E.K.Warburton, R.S.Bender, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), K8 (1955); verbal report.

Levels $C^{(12)}(n,n)$ $E_n = 2.4$ to 3.7

Res.	Level	J	Γ_n
2.95	7.67	$3/2^+$	0.06
3.65	8.32	$3/2^+$	1.20

Phase shift analysis of n,n(θ) scin

R.W.Maier, P.Scherrer, G.Trumpy, Helv. Phys. Acta 27, 577 (1954).

C^{14} 6 8 $\sim 5600^y$

Comparison with S^{35} shows β spectrum has allowed shape down to 3 kev pc

A.Moljk, S.C.Curran, Phys. Rev. 96, 395(1954).

C^{14} 6 8 $\sim 5600^y$

β^- 0.155 1 F-K linear above 0.03
Source thickness ~15 $\mu g/cm^2$ sl

H.H.Forster, A.Oswald, Phys. Rev. 96,1030 (1954).

β^- 0.1585 5 F-K linear ($E_\beta > 0.007$)
Source thickness ~6 $\mu g/cm^2$

A.V.Pohm, R.C.Waddell, J.P.Powers, E.N.Jensen, Phys. Rev. 97, 432 (1955).

Levels $C^{(13)}(d,p)$ $E_d = 5.0$ to 7.0

g.s. Q = 5.942 11 sm 90°

6.091
6.723 } $\Delta Q = 0.171 \pm 0.003$
6.894

A.Sperduto, W.W.Buechner, C.K.Bockelman, C.P.Browne, Phys. Rev. 96, 1316 (1954).

Levels $C^{13}(d,p)$ $E_d = 14.5$ s

6.59 2		10.50 2
7.35 2		12.60 2
8.32 2		12.85 2 $\Gamma > 0.1$
9.80 2		12.96 2
10.43 2		

J.N.McGruer, E.K.Warburton, R.S.Bender, Phys. Rev. 99(1955); BAPS 30, #3(Washington), K8 (1955).

C^{15} 6 9 2.4^s

Level $C^{14}(d,p)2.4^sC$ $E_d = 0.6$ to 3.0

g.s. Q = 0.15 15 scin
Q = 0.12 5*

Excitation curve gives J(g.s.) = 5/2, not 1/2

J.A.Rickard, E.L.Hudspeth, W.W.Clendenin, Phys. Rev. 96, 1272 (1954); Phys. Rev. 94, 806A (1954); *K.R.Spearman, quoted in first reference.

N^{14} 7 7 stable

Hyperfine splitting of ^4S g.s. of atomic N observed but no evidence of Q Mic

W.A.Nierenberg, R.Beringer, Phys. Rev. 96, 645 (1954).

$N^{(14)}(\gamma,\alpha)$ $E_\gamma \leq 31$ ppl

σ shows structure for $E_\gamma = 14.5$ to 30 (≤ 0.2 mb)

P.Stoll, Helv. Phys. Acta 27, 395 (1954).

$C^{(12)}(d,n)N^{13}$ g.s. $E_d \geq 0$

For $E_d > 6$, σ falls more slowly than expected for compound nucleus formation.
$\sigma(E_d = 8) = 0.1$

$C^{(12)}(d,t)$

$\sigma(E)$ suggests pick up

D.H.Wilkinson, Phys. Rev. 99(1955); BAPS 30, #3(Washington), K10(1955).

N^{14} 7 7 stable

Levels $N^{(14)}(p,p')$ $E_p = 9.5$ ppl

100†	g.s.	$\sigma(\theta)$ has a max at ~100°
≤1†	(2.31)	
7†	(3.95)	σ symmetric about 90°
	(4.91)	
	(5.10)	

†Relative numbers of p's at 90°

R.G.Freemantle, D.J.Prowse, J.Rotblat, Phys. Rev. 96, 1268 (1954).

$C^{13}(p,\gamma)$

8.06 level $E_p = 0.554$

γ	17†	1.66	1†	5.7 ? scin pr
	15†	2.35	100†	8.05
	13†	4.05		

(4.05 γ) (1.66 γ) (2.35 γ)
4.01 crossover 5 ± 5% of 2.35 γ

B.Hird, C.Whitehead, J.Butler, C.H.Collie, Phys. Rev. 96, 702 (1954).

Levels $N^{(14)}(\alpha,\alpha')$ $E_\alpha = 22$

7.01 6		12.5°, 79°, 90°
7.94 7		
8.45 7	composite?	
10.05 7	composite?	

Levels at 7.4, 7.7, 8.06, 9.49 not observed

D.W.Miller, U.C.Gupta, V.K.Rasmussen, M.B.Sampson, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), RA8.

Level $C^{13}(p,\gamma)$ scin

γ 10.43 $\Gamma = 0.08$ $J = 2-$ $p,\gamma(\theta)$

(Channel spin 0)/(channel spin 1) = 1.5

H.B.Willard, J.D.Kington, J.K.Bair, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), RA7.

Levels $C^{(12)}(d,d)$ $E_d = 2.5$ to 3.4

Level	E_o
12.41	2.51*
12.61	2.74*
12.80	2.96*
12.82	2.99*
12.93	3.12*
13.17	3.39

*Also observed in (d,p)

M.T.McEllistrem, R.Chiba, R.A.Douglas, D.F. Herring, E.A.Silverstein, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), K9(1955).

Levels $C^{12}(d,p)$ $E_d = 2.0$ to 5.0

Level	E_o
12.43	2.53
12.60	2.73
12.86	3.02
13.02	3.34
13.63	3.93
14.34	4.76

$d,p(\theta)$ shows compound nucleus formation and stripping

T.W.Bonner, A.A.Kraus, Jr., J.T.Eisinger, J.B. Marion, Phys. Rev. 99(1955); BAPS 30, #3 (Washington, K7(1955).

N^{15} 7 8 stable

Levels $N^{(14)}(d,p)$ $E_d = 11.9$ scin

g.s.	$l_n = 1$	$d,p(\theta)$
(~5.3)	forward max observed	

F.S.Eby, Phys. Rev. 96, 1355 (1954).

γ $N^{(14)}(d,p\gamma)$ $E_d = 1.06$ scin

5†	0.84
100†	1.88
280†	5.3

L.C.Thompson, Phys. Rev. 96, 369 (1954).

Levels $N^{(14)}(d,p\gamma)$ $E_d = 4$ sl pr

γ	5.26 4*	8.33 4	
	6.33 5	9.13 6	
	7.31 4	10.04 4	

*May be from both O^{15} and N^{15}

R.D.Sent, T.W.Bonner, J.H.McCrary, R.F.Sippel, Phys. Rev. 98, (1955).
BAPS 30, #1(New York), X10.

Levels $N^{14}(d,p)$ $E_d = 7$ ppl

Level	l_n	$d,p(\theta)$
(5.28)	2	
(5.31)	~isotropic	
(6.33)	1	
(7.16)	2	
(7.31)	0	
(7.58)	0 + 2	
(8.32)	0	
(8.57)	0 + 2	

R.D.Sharp, A.Sperduto, W.W.Buechner, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), K11 (1955); verbal report.

Levels $N^{(14)}(d,p)$ $E_d = 5$ to 8 scin 90°

	ΔQ
5.280 10	
6.330 10	
7.165 10	0.149 4
7.314 10	0.263 5
7.575 10	
8.316 10	0.258 4
8.571 10	
9.062 10	0.103 4
9.165 10	
9.834 10	0.239 6
10.069 10	
10.458 10	0.085 3
10.544 10	0.160 4
10.705 10	0.106 3
10.811 10	

Level values based on g.s. Q = 8.615

A.Sperduto, W.W.Buechner, C.K.Bockelman, C.P.Browne, Phys. Rev. 96, 1316 (1954).

N^{15} 7 8 stable

Levels $C^{14}(p,n)$ $E_p = 0.25$ to 1.8
$C^{14}(p,\gamma)$ BF_3, scin

J		Γ (kev)	Γ_n (kev)	Γ_{p_-} (kev)	$\Gamma_\gamma(\gamma_o)$ (ev)
1/2−	11.30*	12	1.6	10.4	0.25
(1/2+)	11.43**	41	33	8	2.3
1/2+	11.61**	475	5	470	28

*$p,n(\theta)$ isotropic, $p\gamma_o(\theta)$ has cos θ term
**$p,n(\theta)$ and $p,\gamma_o(\theta)$ isotropic

G.A.Bartholomew, F.Brown, N.E.Gove, A.E.Litherland, E.B.Paul, Phys. Rev. 96, 1154 (1954).

Levels $N^{(14)}(n,n)$ $E_n = 2.6$ to 4.2

	J	
13.2	7/2+	$n,n(\theta)$
13.6	5/2+	
13.8	3/2+	
14.1	5/2+?	
14.3	5/2+	
14.4	7/2+?	
14.7	5/2+	

D.Speiser, Helv. Phys. Acta 27, 427, 159A; P.Huber, H.R.Striebel, Helv. Phys. Acta 27, 157A (1954).

N^{16} 7 9 7.4[s]

Level $C^{14}(d,p)2.4^sC$ $E_d = 0.6$ to 3.0
12.35 Γ = 0.4 scin ($E_\gamma > 2$)
Level value based on g.s. Q = 10.47

J.A.Rickard, E.L.Hudspeth, W.W.Clendenin, Phys. Rev. 96, 1272 (1954).

O^{15} 8 7 2.1[m]

τ 2.06[m] 2 $O^{(16)}$ (≤25-Mev γ,n)

R.W.Kline, D.J.Zaffarano, Phys. Rev. 96, 1620 (1954).

τ 2.17[m] 5

Level $N^{(14)}(p,\gamma)$ $E_p = 0.8$
7.61 level. Data suggest J = 5/2+

γ			
25†	5.3 1	scin pr ($E_\gamma > 4.5$)	
100†	6.1 1		
	6.6 1		
	7.6 1	$\Gamma_\gamma = 0.013$ ev	

S.Bashkin, R.R.Carlson, E.B.Nelson, Phys. Rev. 98 (1955).
BAPS 30, #1(New York), RA9.

Levels $N^{(14)}(d,n\gamma)$ $E_d = 4$ s1 pr

γ	
5.26 4*	
6.12 6	
6.81 4	

*May be from both O^{15} and N^{15}

R.D.Bent, T.W.Bonner, J.McCrary, R.F.Sippel, Phys. Rev. 98, (1955).
BAPS 30, #1(New York), X10.

O^{16} 8 8 stable

Levels $F^{19}(p,\alpha)$ $E_p = 0.340, 0.873, 0.935$

6.13	$5\times10^{-12} \le \tau \le 10^{-11}$s
6.9	$\tau \le 1.2\times10^{-14}$s
7.1	$\tau \le 8\times10^{-15}$s

From measurement of Doppler shift

S.Devons, G.Manning, D.P.Sunbury, Proc. Phys. Soc. 68A, 18 (1955).

Levels $F^{19}(p,\alpha)$ $E_p = 0.873$ to 1.451

6.14	J = 3−	$p,\alpha(\theta)$
6.91	Γ ~ 0.006 J = 2+	sr
7.12	Γ ~ 0.006 J = 1−	

No evidence for doublets at 6.91, 7.12
No level between 7.12 and 8.7
No evidence for 2− level from $p,\alpha(\theta)$

R.W.Peterson, W.A.Fowler, C.C.Lauritsen, Phys. Rev. 96, 1250 (1954); 93, 1085A (1953).

Levels $O^{(16)}(p,p')$ $E_p = 19$ scin

58°	~6		40°-165°
34°	~7	20°	11.08
28°	8.85	11°	11.51
8°	9.84	6°	12.03
8°	10.34	11°	12.52

*$\int \sigma d\theta$ in mb

R.Sherr, W.F.Hornyak, Phys. Rev. 99(1955); BAPS 30, #3(Washington), K13(1955).

Level $F^{19}(p,\alpha)$ $E_p = 3.1$ to 4.1
8.85 2 J = 2− scin pr
Level indicated by observed γ's

γ			
	vw	1.71 2	
	w	1.92 2	
		2.73 2	

(2.73γ)(6.14γ) (E_γ ~.3-8)(1.71γ, 1.92γ)

B.J.Toppel, D.H.Wilkinson, D.E.Alburger, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), K12 (1955).

Levels $O^{(16)}(p,p')$ $E_p = 19$ scin

Level	Coincidences
8.85	p(~2.4γ)(2.4γ)(~6,~7γ)
9.85	No γ
11.08	pγ γ(~6,~7γ)
12.03	pγ?
12.52	p(C^{12} 4.4γ)

W.F.Hornyak, R.Sherr, Phys. Rev. 99(1955); BAPS 30, #3(Washington), K14(1955).

Levels $C^{(12)}(\alpha,\alpha)$ $E_\alpha = 4.0$ to 7.6

	J	Γ	
10.36	4+	0.036	$\alpha,\alpha(\theta)$
11.10 ?		0.010	
11.25	0+	3.3	
11.51	2+	0.11	
11.62	3−	1.6	
12.43	1−	0.23	

J.W.Bittner, R.D.Moffat, Phys. Rev. 96, 374 (1954); 94, 769A (1954).

O^{16} 8 8 stable

Levels	$O^{16}(\gamma,\alpha)$	$E_\gamma \geq 31$ ppl
	14.2 ?	22.6
	16.8	23.2 ?
	17.3	24.6 ?

J = 2, T = 0 for above levels from $\gamma,\alpha(\theta)$
$\sigma(E_\gamma = 17.6) = 0.15$ mb

P.Stoll, Helv. Phys. Acta 27, 395(1954).

O^{17} 8 9 stable

$C^{13}(\alpha,n)$ $E_\alpha = 5.3$
$\sigma = 10 \pm 1$ mb. n yield 1/30 that from $Be^9(\alpha,n)$

M.E.Mahmias, P.Savel, Compt. rend. 239, 761 (1954).

Levels	$O^{16}(d,p)$	$E_d = 1.1$ to 2.4
g.s.*		
(0.87)**		

*Stripping process still present at $E_d = 1.1$
**Stripping process not present at $E_d = 1.1$

J.C.Grosskreutz, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), PA1(1955).

Levels	$O^{16}(d,p)$	$E_d = 5.0$ to 8.5
g.s.	Q = 1.915 *10*	σ_T 90°
0.875 *12*		
3.055 *12*		
3.840 *12*		

A.Sperduto, W.W.Buechner, C.K.Bockelman, C.P.Browne, Phys. Rev. 96, 1316 (1954).

O^{18} 8 10 stable

Level	$O^{17}(d,p)$	$E_d = 0.855$ sd
g.s.	Q = 5.821 *10*	61°,135°
1.986 *13*		

K. Ahnlund, Phys. Rev. 96, 999 (1954).

O^{19} 8 11 29.4 s

β^- (2.9) log ft = 4.3
(4.5) log ft = 5.6
γ intensities show log ft $\geq$ 5.3, $\geq$ 7.3, $\geq$ 6.5 for transitions to 1.37, 0.112, g.s. F^{19} levels

γ_1	4†	0.112 *2*	$\tau \ll 10^{-6}$ s
γ_2	100†	0.200 *2*	$\tau = 1.0 \pm 0.2 \times 10^{-7}$ s
γ_3	67†	1.366 *8*	

$\gamma_2\gamma_3(\theta)$ supports decay scheme. See F^{19}.
No 0.22 γ (< 0.04†) No 1.59 γ (< 0.03†)

G.A.Jones, W.R.Phillips, C.M.P.Johnson, D.H.Wilkinson, Phys. Rev. 96, 547 (1954).

Levels	$O^{18}(d,p)$	$E_d = 0.855$ sd
g.s.?	Q = 1.730 *8*	61°,135°
0.094 *11*		
1.468 *10*		

C.Wiltkowsky, K.Ahnlund, Phys. Rev. 96, 996 (1954).

F^{17} 9 8 66 s

Levels	$N^{14}(\alpha,n)$	pc; n thresh
g.s.	Q = -4.73 *10*	
0.53		

W.T.Doyle, J.S.Robbins, Phys. Rev. 98 (1955). BAPS 30, #1(New York), Rall; verbal report.

F^{18} 9 9 1.87 h

$O^{16}(d,\gamma)1.87^h F^{18}$ $E_d = 1.7$
$\sigma \sim 0.01$ mb
$O^{17}(d,n)1.87^h F^{18}$ $E_d = 1.7$
$\sigma \sim 30$ mb

J.W.Butler, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), PA2(1955).

Levels	$N^{14}(\alpha,p)$	$E_\alpha = 5.30$ cc $\alpha,p(\theta)$
6.0		$1-0.64\cos\theta - 1.2\cos^2\theta$
7.2		$1-1.1\cos^2\theta$
7.8		$1-1.1\cos^2\theta$

G.S.Mani, P.Pandhi, Proc. Indian Acad. Sci. 40A, 61 (1954).

F^{19} 9 10 stable

Levels	$F^{19}(p,p')$	$E_p = 1.431$
0.1088 *8*		$p,p'(\theta)$
0.1960 *14*		

See Ne^{20} for σ's

R.W.Peterson, W.A.Fowler, C.C.Lauritsen, Phys. Rev. 96, 1250; 94, 1075, 951A (1954).

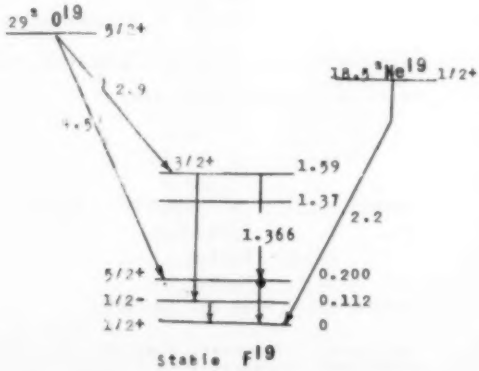
Levels	$F^{19}(\alpha,\alpha'\gamma)$	$E_\alpha = 0.6$ to 2.8
0.109	$J = 1/2^-$	$\sigma(E)$; $\alpha,\gamma(\theta)$
0.196	$J = 5/2^+$	

Spin assignments consistent with $\sigma(E)$; $\alpha,\gamma(\theta)$; and τ_γ

R.Sherr, C.W.Li, R.F.Christy, Phys. Rev. 96, 1258 (1954); 94, 1076 (1954).

Levels	$F^{19}(\alpha,\alpha'\gamma)$	$E_\alpha = 0.8$ to 2.0
γ	0.113	E1, E2 ? from γ yield
	0.198*	E2 from γ yield/p yield
	$F^{19}(\alpha,\alpha'\gamma)$	$E_\alpha = 1.72$ to 1.92
	$F^{19}(p,p'\gamma)$	$E_p = 0.71$ to 0.76
γ	0.198	E2 from α yield/p yield

C.M.Tenner, N.P.Heydenburg, Phys. Rev. 96, 426 (1 54); BAPS 30, #1 (New York), X5.



G.A.Jones, W.R.Phillips, C.M.P.Johnson, D.H.Wilkinson, Phys. Rev. 96, 547 (1954).

F^{19} 9 10 stable

Level $O^{18}(d,n\gamma)$ scin $(4 < E_d < 7.5)$

6.03*

Threshold for 6.03 and 4.37 γ's at $E_d = 0.350$
No γ to 0.197 level ($< 5\%$)*

H.D.Holmgren, J.W.Butler, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), TA7(1955); *verbal report.

Levels	$O^{18}(p,\gamma)$*	$E_p = 0.3$ to 2.6
8.49	10.15	scin
8.76	10.22	
9.65	10.28	
9.83	10.36	
10.04		

*γ to g.s. or low lying levels

E.L.Hudspeth, I.L.Morgan, J.T.Peoples, Phys. Rev. 99(1955); BAPS 30, #3(Washington), PA3 (1955)

F^{20} 9 11 12^s

γ $F^{19}(d,p\gamma)$ $E_d = 1.05$ scin

1† (0.64)
2.5† (1.06)

$\sigma[F^{19}(d,p)] \gg \sigma[F^{19}(d,n+1.63\ \gamma)]$

L.C.Thompson, Phys. Rev. 96, 369 (1954).

Levels	$F^{19}(n,\alpha)7.4^s N^{16}$			$E_n = 3.5$ to 6.2
11.1†	10.56			
11.7†	11.05	11.9†	11.91	
12.2†	11.39	11.4†	12.20	
12.3†	11.73	10.6†	12.38	

†σ in mb

M.A.Bostrom, E.L.Hudspeth, I.L.Morgan, Phys. Rev. 99(1955); BAPS 30, #3(Washington), PA4 (1955); verbal report.

F^{21} 9 12 5^s

Levels $F^{19}(t,p)$ $E_t = 0.9$

g.s. Q = 6.03 *10* ppl
0.89 *8* 68°, 84°, 130°
3.34 *8* ?
4.01 *6* ?

C.B.Bigham, K.W.Allen, E.Almqvist, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), K5(1955).

Ne 10

Large variations for Ne^{21}/Ne^{20} and Ne^{22}/Ne^{20} in radioactive ores attributed to $O^{18}(\alpha,n)$ and $F^{19}(\alpha,n\beta^+)$

G.W.Wetherill, Phys. Rev. 96, 679 (1954).

Ne^{19} 10 9 18.5^s

β^+ ~100% (2.2) log ft = 3.3

Absence of low energy γ's shows log ft $\geq$ 6.0, $\geq$ 5.5 for transitions to 0.112, 0.200 F^{19} levels

G.A.Jones, W.R.Phillips, C.W.P.Johnson, D.H.Wilkinson, Phys. Rev. 96, 547 (1954).

Ne^{19} 10 10 18.5^s

β^+, $F^{19}(\theta)$ gives $C_S \simeq C_T$ assuming F^{19} configuration is $(d_{5/2})^3_{1/2}$
VTP interaction ruled out

D.R.Maxson, J.S.Allen, W.K.Jentschke, Phys. Rev. 97, 109 (1955).

Ne^{20} 10 10 stable

Levels	$Ne^{(20)}(p,p')$	$E_p = 9.5$ ppl
g.s.	$\sigma(\theta)$ has a max. at 90°	
1.58 *1*	σ symmetric about 90°	
4.20 *1*		
4.95 *2*		
5.62 *2*		

R.G.Freemantle, D.J.Prowse, A.Hossain, J.Rotblat, Phys. Rev. 96, 1270 (1954).

Levels	$F^{19}(p,p)$	$E_p = 0.5$ to 2.1 s	
(13.438)	$\Gamma_p \ll \Gamma$		
(13.505)	$\Gamma_p \simeq \Gamma$		
(13.659)			
(13.700)	$\Gamma_p \ll \Gamma$	$l_p = 1$	
(13.759)	$\Gamma_p \ll \Gamma$		
(14.157)		$l_p = 1$	
(14.182)		$l_p = 1$	
(14.230)		$l_p = 0$	

From preliminary analysis of $p,p(\theta)$ at 4 angles

G.Dearnaley, Phil. Mag. 45, 1213 (1954).

Levels $F^{19}(p, > 8\text{-Mev}\ \gamma)$ $E_p = 0.55$ to 1.45

Res.	Level	Yield*	scin $(E_\gamma > 8)$
0.669	13.505	180×10^{-4}	
0.874	13.700	3	
0.935	13.759	3	
0.980	13.801	22	
1.090	13.905	34	
1.280	14.086	6	
1.320	14.125	90	
1.355	14.157	12	
1.380	14.181	8	
1.430	14.229	35	

* > 8-Mev γ's/8-Mev γ's from O^{16}

G.K.Farney, H.H.Givin, B.D.Kern, T.W.Hahn, Phys. Rev. 97, 720 (1955).

Levels $F^{19}(p,\alpha)$ 57
$F^{19}(p,p'\gamma)$ scin

Res.	Level	J^π	$\sigma(0.109\gamma)$	$\sigma(0.196\gamma)$
0.873	13.70	2^-	< 1	~90
0.935	13.76	1^+	130	1.1
1.290	14.10	3^+		
1.355	14.16	2^-		
1.381	14.18	2^-	24	42**
1.431	14.23	1^+	'187**	~7**

mb

*From $p,\alpha(\theta)$ and $p,p'(\theta)$
**From p,p' rather than $p,p'\gamma$

R.W.Peterson, W.A.Fowler, C.C.Lauritsen, Phys. Rev. 96, 1250, 851A (1954).

Na^{21} 11 10 23^{s}

Levels $Ne^{(20)}(p,p)$ E_p = 0.2 to 4.4

	Γ(kev)	J	
4.18	180	3/2-	pc
4.31	6	5/2+	
4.49	17	3/2+	
5.48	110	1/2+	
5.85	25	3/2-	
6.10	6	5/2-,7/2-	
6.53	150	3/2+,5/2+	

For all levels except 6.10 $\Gamma_{el} > 0.7\ \Gamma$
Additional resonances at E_p = 2.7(double ?), 3.42(Γ~20 kev), and 3.552(Γ~2 kev)

W.Haeberli, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), H11(1955); W.Haeberli, A.Galonsky, E.Goldberg, R.Douglas, Phys. Rev. 91, 438A (1953).

Na^{22} 11 11 2.6^{y}

ε 11.0±0.9% γ^{+}/1.28 γ scin

W.E.Kreger, Phys. Rev. 96, 1554, 854A (1954).

γ (1.28) $\alpha = 6.7 \pm 0.7 \times 10^{-6}$* s

*From comparison with α for 1.33 γ from Co^{60}.

R.D.Lessner, G.W.Hinman, Phys. Rev. 96, 1607 (1954); 90, 370A (1953).

Levels $F^{19}(\alpha,n)$ E_α = 8

g.s.	Q = 2.0	pc, n thresh
.4		
1.1		
2.2		

W. . Doyle, A.R.Quinton, Phys. Rev. 97, 252A (1955).

Levels $Mg^{(24)}(d,\alpha)$ E_d = 5 to 7

g.s.	Q = 1.953	12° 30°,90° s
0.59		
0.89	2.22 ?	
1.53	2.58	
1.94	2.98	
1.99	3.07	

Yields of α's to g.s. and 0.59 level about equal

. . Bleaney, W.C.Cobb, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), PA5(1955); "virtual compound"

Na^{23} 11 12 stable

Level $Na^{23}(\alpha,\alpha'\gamma)$ E_α = 1.5 to 3.7

γ 0.446 εB(E2) = 0.041 scin

E2 excitation. Correction for compound nuclear formation by using (α, p γ) yield

$Na^{23}(\alpha,\alpha'\gamma)$ E_α = 2.00 to 2.22

$Na^{23}(p,p'\gamma)$ E_p = 0.90 to 0.98

γ 0.446 E2 from α yield/p yield

G.M.Temmer, N.P.Heydenburg, Phys. Rev. 96, 426 (1954); 95, 629A (1954); 98 (1955); BAPS 30, #1 (New York), X5.

Levels $F^{19}(\alpha,\alpha' + 0.109\gamma)$ scin E_α = 0.6 to 2.8

1†	12.17	6†	12.53
2†	12.24	300†	12.59
4†	12.32	450†	12.69
6†	12.36	2.5†	12.75
5†	12.43	60†	12.78
1.4†	12.47		

$F^{19}(\alpha,\alpha' + 0.198\gamma)$

10†	12.36?	180†	12.69
20†	12.53		12.75?
40†	12.59	470†	12.78

$F^{19}(\alpha,p + 1.28\gamma)$

7.9†	11.59	380†	12.24
12.8†	11.63	1200†	12.32
13.8†	11.66		12.36?
34.6†	11.70	320†	12.40
22.6†	11.74		12.43?
24.6†	11.87	300†	12.47
3.4†	12.05	370†	12.50
81.7†	12.08	3400†	12.53
60.7†	12.11	4600†	12.59
60.6†	12.15	2400†	12.69
173†	12.17		12.75?
42†	12.22	5500†	12.78

†peak γ yields/10^{12} α's

R.Sherr, C.W.Li, R.F.Christy, Phys. Rev. 96, 1254 (1954).

Mg 12

γ Mg(n, ?γ) E_n = 3.2 scin

0.38	st	1.30
0.59		1.79

V.E.Scherrer, B.A.Allison, W.R.Faust, Phys. Rev. 96, 38[illegible] (1954).

Mg^{22}? 12? 10

γ 0.13^{s} Mg(23-Mev p)

See also Al^{23}

H.Tyrén, P. A.Tove, Phys. Rev. 96, 773(1954).

Mg^{24} 12 12 stable

Levels $Mg^{(24)}(p,p')$ E_p = 3.0 to 6.5

$Mg^{(24)}(d,d')$ E_d = 4.0 to 7.8

g.s.	a
1.37 4	

Graph of $\sigma(E, 70°)$ given

G.W.Greenlees, Proc. Phys. Soc. 68A, 97 (1955).

Na^{23} 11 11 stable

μ +0.11 (or -0.91) H

N.L.Ford, I.I.Rabi, B.Senitzky, Phys. Rev. 97, 438 (1955).

$Mg^{24}_{12\ 12}$ stable

Levels — $Mg^{(24)}(p,p')$ $E_p = 9.9$

g.s.		$p,p(\theta)$*
(1.37)		$p,p'(\theta)$**
~4.2		90°
5.1 *1*	Mg^{24}?	
5.9 *1*		
6.3 *1*		pc, scin

*Diffraction effects observed

**Analyzed for direct collision and compound nucleus formation

G.E.Fischer, Phys. Rev. 96, 704 (1954).

Levels — $Al^{27}(p,\alpha)$ $E_p = 6.5$ ppl

0.16†	g.s. Q = 1.61 *4*	
0.61†	1.38	
0.15†	4.18 doublet not resolved	

†$d\sigma/d\omega$ at 90°

G.W.Greenlees, Proc. Phys. Soc. 67A, 1107 (1954).

Level — $Na^{23}(p,\gamma)$

11.99 level $E_p = 0.31$

γ	11†	1.38 *2*		scin
	6†	4.11 *5*	double ?	scin pr
	1.3†	6.7 *2*		
	8†	7.7 *1*		
	7†	10.6 *2*		

No 2.76 γ

B.Hird, C.Whitehead, J.Butler, C.H.Collie, Phys. Rev. 96, 702 (1954).

Levels — $Na^{23}(p,\gamma)$ scin

$Na^{23}(p,\alpha)$ s

11.98 level $E_p = 0.287$

$Y_\alpha = 0.2$ $Y_\gamma < 0.05$

12.00 level $E_p = 0.310$

γ	18†	1.38	3.5†	6.75
	4.4†	2.88	15†	7.75
	2.7†	4.0	10†	10.5
	13†	4.24		

$Y_\alpha < 0.2$ $Y_\gamma = 0.37$

12.03 level $E_p = 0.338$

$Y_\alpha = 0.17$ $Y_\gamma < 0.01$

12.20 level $E_p = 0.515$

γ	12†	1.39	1.2†	7.1
	0.6†	2.86	2.4†	8.1
	1.6†	4.23	10†	10.8

$Y_\alpha < 0.04$ $Y_\gamma = 0.16$

12.27 level $E_p = 0.593$

γ	20†	1.38	12.7†	4.24
	8†	1.64*	6.1†	7.01
	10†	2.86	19†	8.09
	3†	3.93	10†	10.8

*Assigned to Ne^{20} $Y_\alpha = 84$ $Y_\gamma = 0.35$

(CONTINUED)

$Mg^{24}_{12\ 12}$ stable

12.?? level $E_p = 0.679$

γ	32†	1.38	7†	5.5
		1.6*	19†	7.09
	14†	2.84	39†	8.15
	10†	3.91	10†	10.9
	28†	4.23		

*Assigned to Ne^{20} $Y_\alpha < 0.13$ $Y_\gamma = 1.09$

Y_α, Y_γ = α,γ reaction yield per 10^{10} protons

(~10.6 γ) (1.38 γ) (~8.0 γ) (4.24 γ, ~2.8 γ) (1.38 γ) (~7.0 γ, ~8.0 γ)

F.C.Flack, J.G.Rutherglen, P.J.Grant, Proc. Phys. Soc. 67A, 973 (1954).

Levels — $Na^{23}(p,\gamma)$ $E_p = 0.5$ to 1.0

		E_o
10†	12.194	0.5120 *20*
30†	12.210	0.5923 *20*
100†	12.367	0.6770 *20*
45†	12.415	0.7430 *20*
90†	12.540	0.8737* *20*

*Not $F^{19}(p,\alpha\gamma)$ resonance ($< 2\times10^{-4}$% F present)

K.Nybø, T.Grotdal, Nature 175, 130 (1955).

Levels — $Na^{23}(p, >8\text{-Mev } \gamma)$ $E_p = 0.55$ to 1.45

12.276, 12.681, 12.830, 12.863 scin($E_\gamma > 8$)

G.K.Farney, H.H.Givin, B.D.Kern, T.M.Haim, Phys. Rev. 97, 720 (1955).

Levels — $Na^{23}(p,\alpha_0)$ $E_p = 1.0$ to 1.9 pc

	J	
12.673	3-	$p\,\alpha(\theta)$
12.751		
12.793	0+	
12.821	2+	
12.936		
13.43 double ?		

P.M.Stelson, Phys. Rev. 96, 1584 (1954).

$Al^{23}_{13\ 10}$? τ 0.13[S] $Mg(^{23}Mg+p)$

See also Mg^{23}

H.Tyrén, P.A.Tove, Phys. Rev. 96, 773 (1954).

$Al^{25}_{13\ 12}$ 7.6[S] τ 7.2[S] Mg^{24}(825-kev p,γ)

D.W.Green, J.C.Harris, J.N.Cooper, Phys. Rev. 96, 817A (1954).

Levels — $Mg^{24}(p,\gamma)$ $E_p = 0.2$ to 0.7

Level	E_o	
2.51	0.224 *15*	scin
2.69	0.421 *15*	

J.C.Kluyver, C. Van der Leun, P.M.Endt, Physica 20, 1287 (1954).

$Al^{25}_{13\ 12}$ 7.6^s

Levels $Mg^{24}(p,\gamma)$ E_p = 0.8 to 2.1

	J	Γ_γ(ev)	p,$\gamma(\theta)$	
(3.09)	3/2-	0.16		scin
(3.72)*	7/2-	0.008		
(3.85)	1/2-	0.298		
(3.88)	5/2+	0.03		
(4.22)	3/2+	~40		

*Observed 0.85, 0.95, 1.34, 1.91, 3.72 γ's

E.B.Paul, G.A.Bartholomew, H.E.Gove, A.E. Litherland, Phys. Rev. 99(1955)†; BAPS 30, #3 (Washington), PA8(1955)†; verbal report.

$Al^{26}_{13\ 13}$ 6.7^s

τ_1 6.4^s Mg^{25}(563,720-kev p,γ)

D.W.Green, J.C.Harris, J.N.Cooper, Phys. Rev. 96, 817A (1954).

β^+ 3.20 *5* al

R.W.Kavanagh, W.R.Willis, R.Sherr, Phys. Rev. 97, 248 (1955)†; Phys. Rev. 98 (1955)†; BAPS 30, #1 (New York), RA12 (1955).

$Al^{26}_{13\ 13}$ $\sim 10^6$y

τ_2	$\sim 10^6$y	Mg(15-Mev d)	chem
β^+ ?	~1		a
γ	0.5 (annihilation?)		scin
	1.9		

J.R.Simanton, R.A.Rightmire, A.L.Long, T.P.Kohman, Phys. Rev. 96, 1711 (1954).

Levels $Na^{23}(\alpha,n)$

g.s.	Q = -2.9		pc
0.3*		1.9	n thresh
1.0		2.5	
1.4		3.0	

*$\gamma^\pm$ first appears at Q = -3.2 scin

W.T.Doyle, A.B.Robbins, Phys. Rev. 98 (1955)†. BAPS 30, #1 (New York), RA11; verbal report.

Resonances $Mg^{25}(p,\gamma)$

E_o	γ yield	β^+ yield
0.3167 *7*	70	100
0.3915 *5*	140	400
0.4365 *4*	200	< 20*
0.4956 *6*	180	350
0.5134 *7*	155	320
0.5304 *7*	92	220

*Suggests 0.4365 resonance de-excites preferentially to long-lived Al^{26} g.s.

S.E.Hunt, D.A.Hancock, Phys. Rev. 97, 567 (1955)†.

Capture γ's $Mg^{25}(p,\gamma)$ E_p = 0.3 to 0.7

6.62 level E_o = 0.321 *15* $\Gamma_\gamma(2J+1)$ = 0.3ev

27†	0.420 *5*		3.40 *6* ?	scin
6†	0.836 *20*	18†	4.82 *4*	
	1.34 *3*	18†	6.22 *5*	
	2.68 *6*	7†	$\gamma^\pm$	

(CONTINUED)

$Al^{26}_{13\ 13}$ $\sim 10^6$y

6.69 level E_o = 0.395 *15* $\Gamma_\gamma(2J+1)$ = 0.6ev

17†	0.421 *5*		2.78 *5*
9†	0.829 *8*		3.48 *8*
4†	1.002 *15*	18†	4.61 *7*
	1.34 *3*	4†	6.21 *6*
	1.68 *6*	≤12†	$\gamma^\pm$
	2.06 *6*		

6.73 level E_o = 0.441 *15* Γ_γ = 0.08ev J = 4-

19†	0.415 *5*	8†	4.70 *10*
	1.33 *2*	6†	6.28 *12*
	1.84 *4*	25†	6.77 *8*
	2.35 *7*	? ≤21†	$\gamma^\pm$
	3.82 *6*		

E_o = 0.501 *15* Not resolved

E_o = 0.518 *15* $\Gamma_\gamma(2J+1)$ = 0.8ev

41†	0.419 *5*	10†	4.22 *6*
7†	0.817 *8*	12†	4.72 *4*
3†	0.999 *15*	4†	5.04 *7*
	1.34 *3*	10†	6.36 *5*
	2.36 *6*	≤37†	$\gamma^\pm$
	2.72 *8*		

6.85 level E_o = 0.580 *15* $\Gamma_\gamma(2J+1)$ = 1.5ev

25†	0.423 *7*	22†	4.27 *4*
9†	0.820 *4*	~7†	4.92 *8*
4†	1.011 *15*	~3†	5.82 *10*
	1.34 *2*	18†	6.44 *4*
	1.87 *6*	~3†	6.80 *8*
	2.41 *7*	? 25†	
	2.85 *5*		

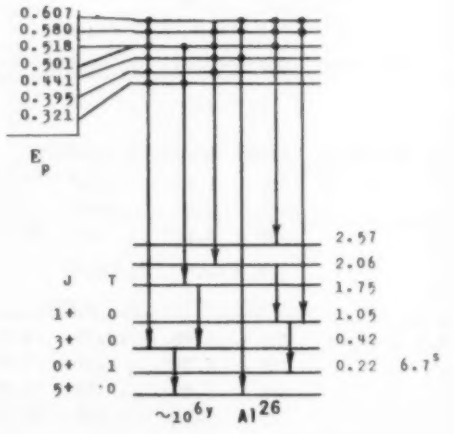
6.89 level E_o = 0.607 *15* $\Gamma_\gamma(2J+1)$ = 1.1ev

27†	0.412 *7*		2.94 *6*
10†	0.823 *8*	25†	4.34 *5*
6†	0.995 *15*	~7†	4.84 *8*
	1.35 *3*	~3†	5.79 *10*
	1.63 *3*	19†	6.47 *5*
	1.87 *4*	~3†	6.81 *10*
	2.05 *6*	27†	$\gamma^\pm$
	2.25 *4*		

6.95 level E_o = 0.667 *15* $\Gamma_\gamma(2J+1)$ = 0.3ev

6.97 level E_o = 0.688 *15* $\Gamma_\gamma(2J+1)$ = 1.6ev

†Intensity as % of all γ's with $E_\gamma > 1$



J.C.Kluyver, C.Van der Leun, P.M.Endt, Physica 20, 1287 (1954)†; Phys. Rev. 94, 1795 (1954)†.

Al^{26} 13 13 $\sim 10^6$y

Capture γ's $Mg^{25}(p,\gamma)$ scin

6.98 level	E_o = 0.697			
	0.416			
7.01 level	E_o = 0.730	high $\gamma^\pm$ yield		
	0.416		1.44 *3*	
3†	0.833 *6**		2.46 *3*	
2†	1.022 *6**		5.00 *5**	
7.20 level	E_o = 0.933	high $\gamma^\pm$ yield		
	0.833		1.022	
7.23 level	E_o = 0.958	low $\gamma^\pm$ yield		
2†	0.416 *4**	1†	2.08 *2***	
2†	1.67 *2**		*5*	
	E_o = 0.990, E_o = 1.046, E_o = 1.086	high $\gamma^\pm$ yield		
	0.416		1.022	
	0.833			

*In prompt coincidence (delay < $4^{\mu s}$)
**Not in coincidence with 0.416 γ

R.W.Kavanagh, W.R.Willis, R.Sherr, Phys. Rev. 97, 248 (1955); Phys. Rev. 98 (1955); BAPS 30, #1 (New York), HA12 (1955).

Al^{27} 13 14 stable

γ $Al^{27}(n,?\gamma)$ E_n = 3.2 scin

0.05	1.20	
0.89	1.70	
1.05	2.2	

V.E.Scherrer, B.A.Allison, W.H.Faust, Phys. Rev. 96, 386 (1954).

Levels $Al^{27}(p,p')$ E_p = 5.64 to 8.45

0.842	4.054	5.425	scin 90°
1.013	4.403	5.491	
2.213	4.505	5.544	
2.732	4.576	5.659	
2.977	4.807	5.821	
3.001	5.150	5.951 ?	
3.677	5.242		
3.954	5.410		

No 5.00 or 5.11 level (peaks due to C^{12})
No other level below 5.3 (yield < 5% of 0.842 level)
All values ± 0.006 Resolution 0.015

C.P.Browne, S.F.Zimmerman, W.W.Buechner, Phys. Rev. 96, 725 (1954).

Levels $Na^{23}(\alpha,p+1.83\gamma)$ E_α = 1.8 to 3.7

11.77	12.69	scin
11.93	12.72	
12.08	12.79	
12.24	12.85	
12.28	12.90	
12.35	13.00	
12.49	13.08	
12.57	13.15	

G.M.Temmer, N.P.Heydenburg, Phys. Rev. 96, 426 (1954).

Al^{27} 13 14 stable

Levels $Al^{27}(p,p')$ E_p = 4.9

0.84†	g.s.	1.2†	2.22	ppl
0.56†	0.83 *10*	0.84†	3.01	
1.4†	1.01			

†$d\sigma/d\omega$ in mb/sterad at 45°
Possible level between 2.2 and 3.0

K.B.Mather, Australian J. Phys. 7, 658 (1954).

Levels $Mg^{26}(p,\gamma)$ E_p = 0.3 to 0.7

Level		E_o	
8.550	w	0.300 *15*	scin
8.588		0.340 *15*	
8.702		0.458 *15*	

J.C.Kluyver, C.Van der Leun, P.M.Endt, Physica 20, 1287 (1954).

Levels $Mg^{26}(p,\gamma)$

Level	E_o
8.587	0.3385 *5*
8.698	0.4542 *3*

S.E.Hunt, D.A.Hancock, Phys. Rev. 97, 567 (1955).

Al^{29} 13 16 6.6m

γ 89% 1.28 $Si^{(29)}(n,p)$ scin
9% 2.43
No 2.03 γ (< 4%)
No 1.15 γ (< 11%) No $\gamma\gamma$ $\gamma\gamma$ scin

H.Roderick, O.Lönsjö, W.E.Meyerhof, Phys. Rev. 97, 97 (1955); 90, 371A (1953).

Si^{26}? 14 12

τ 1.7^s Al^{27}(23-Mev p)

H.Tyrén, P.I Tove, Phys. Rev. 96, 773(1954).

Si^{28} 14 14 stable

Level $Si^{28}(p,p'\gamma)$ E_p = 3.1
γ 1.76 *2* scin

H.O.Cohn, J.W.Bair, J.D.Kington, H.B.Willard, Phys. Rev. 99(1955); BAPS 30, #3(Washington), PA10 (1955); verbal report.

Si^{29} 14 15 stable

Levels $Si^{(28)}(d,p\gamma)$ E_d = 2.8 scin

γ	6†	1.28	2†	3.07
	4†	2.03	10†	4.93
	1†	2.43	4†	6.38

H.Roderick, O.Lönsjö, W.E.Meyerhof, Phys. Rev. 97, 97 (1955).

Levels $Si^{28}(d,p\gamma)$ E_d = 1.35 scin

γ	1.25	3.08
	2.04	~4.9

L.C.Thompson, Phys. Rev. 96, 369 (1954).

P^{28} 15 13 0.28^{s}

τ 0.27^{s} Si(20-Mev p)

H.Tyrén, P.A.Tove, Phys. Rev. 96, 773 (1954).

P^{29} 15 14 4.45^{s}

τ 4.45^{s} *5* $Si^{(28)}$(2.8-Mev d,n)

β^+ 98.8% 3.945 *5* sl

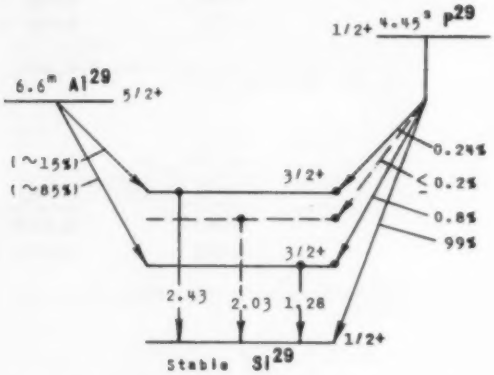
γ 0.8% 1.28 $\gamma^{\pm}\gamma/\gamma^{\pm}$, scin

≤0.15% 2.03 ?

0.2-0.5% 2.43

(1.28γ, 2.03γ?, 2.43γ)$\gamma^{\pm}$

No higher energy γ's detected



M.Roderick, O.Lönsjö, W.E.Meyerhof, Phys.Rev. 97, 97 (1955); 90, 371A (1953).

Levels Si^{28}(p,p' + 1.78γ) E_p = 3 to 5

5.72 6.82 0°, scin

5.95 7.01 (double?)

6.18 7.25

6.31 7.44

H.O.Cohn, J.K.Bair, J.D.Kington, H.B.Willard, Phys. Rev. 99(1955); BAPS 30, #3 (Washington) PA10 (1955); verbal report.

P^{30} 15 15 2.5^{m}

τ 2.55^{m} *5*

Levels Si^{29}(p,γ) E_p = 0.3 to 1.2

E_p	Level	γ's
0.326	5.83	
0.414	5.91	0.69, 5.9,
0.696	6.18	0.69, 1.25, 2.46, 2.67 4.21
0.727	6.21	0.69, 1.44, 2.24, 3.27
0.917	6.40	0.69, 1.44, 1.98, 4.40 5.65
0.956	6.44	1.44?

S.Miyani, J.N.Cooper, J.C.Harris, Phys. Rev. 99(1955); BAPS 30, #3(Washington), PA11(1955); verbal report.

P^{31} 15 16 stable

Level ? P^{31}(p,?γ) E_p = 1.4 to 3.4

γ 1.26 *15* scin

No evidence for other P^{31} low-lying levels

J.W.Olness, H.W.Lewis, Phys. Rev. 99(1955); BAPS 30, #3(Washington), TA1(1955).

P^{31} 15 16 stable

γ P^{31}(n,?γ) E_n = 3.2 scin

1.0 1.75

st 1.24 2.1

1.60

V.E.Scherrer, B.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

P^{32} 15 17 14.3^{d}

β^- 1.712 *8* P^{31}(n,γ) s

F-K linear (E_β > 0.06)

N.M.Anton'eva, A.A.Bashilov, B.S.Dzhelepov, V.I.Orlov, Izvest. Akad. Nauk Ser. Fiz. SSSR 18, 93 (1954).

Internal bremsstrahlung energy yield per β is 2.87×10^{-3} mc^2 (21% greater than theoretical value). Spectral shape disagrees with theory for E > 600 kev. scin

K.Lidén, W.Starfelt, Phys. Rev. 97, 419 (1955).

$e^+/e^- \leq 1.5 \times 10^{-9}$ $\gamma^{\pm}\gamma^{\pm}$

J.S.Greenberg, M.Deutsch, Phys. Rev. 99(1955); BAPS 30, #3(Washington), X6 (1955).

S^{31} 16 15 2.4^{s}

Levels P^{31}(p,n) E_p = 17.5

g.s. Q = -6.03 *15*

1.13 *20* 4.60 *15*

2.23 *15* 6.20 *20*

3.29 *15* ppl 30°, 90°, 150°

g.s. n's peaked in forward direction

A.Rubin, F.Ajzenberg, J.B.Reynolds, Phys. Rev. 98 (1955).
BAPS 30, #1(New York), RA14.

S^{32} 16 16 stable

Capture γ's P^{31}(p,γ) E_p = 1.30

0.9 ? 4.4 scin

2.25 7.8 *4*

2.56 9.8 *4*

3.8

(E_γ > 1)(2.25γ, 3.8γ, 4.4γ)

(E_γ > 4)(0.9γ?, 2.25γ)

B.D.Kern, L.W.Cochran, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), PA12(1955); verbal report.

Level $S^{(32)}$(e,e') E_e = 150 to 188

6.8

J.M.Fregeau, R.Hofstadter, Phys. Rev. 98(1955). BAPS 30, #1 (New York), RA6; verbal report.

Levels P^{31}(p,α) E_p = 1.0 to 2.5

	Level	E_o	Γ(kev)	Γ_γ
22°	10.33	1.52	9	
25°	10.45	1.64	~5	
43°	10.70	1.90	27	observable
37°	10.83	2.03	18	observable

°σ(90°) in mb

12 additional resonances found with Γ < 4 kev

R.L.Clarke, E.Almqvist, E.B.Paul, Phys. Rev. 99(1955); BAPS 30, #3(Washington), TA2(1955).

S^{32} 16 16 stable

Levels $P^{31}(p,?\gamma)$ E_p = 1.4 to 3.4
11.1-12.2

21 resonances for 1.28 γ for $E_p > 2.3$ from (p,p')?
Resonances for 1.8 γ for $E_p > 2.47$ from (p,α)?

J.W.Olness, H.W.Lewis, Phys. Rev. 99(1955); BAPS 30, #3(Washington), TA1(1955).

S^{34} 16 18 stable

Levels $P^{31}(\alpha,p)$ E_α = 8.1
g.s. Q = 0.5 scin
0.7 ?* 3.0 ?
2.1 3.6 ?
*Assignment to S^{34} uncertain

G.F.Pieper, G.S.Stanford, P. von Herrmann, Phys. Rev. 98 (1955).
BAPS 30, #1(New York) RA13.

S^{35} 16 19 87d

β^- (0.167) pc
After instrumental corrections F-K plot linear ($E_\beta > 0.005$)

A.Moljk, S.C.Curran, Phys. Rev. 96, 395(1954)

β^- 0.165 5 sl
Includes correction of -C.002 for 3% resolution

L.Fauvrais, T.Yuasa, Compt. rend. 239, 1627 (1954).

Internal bremsstrahlung energy yield per β is 2.23×10^{-5} mc^2 (35% greater than theoretical value). Spectral shape also shows departure from theory. scin

M.Starfelt, N.L.Svantesson, Phys. Rev. 97, 708 (1955).

K vacancy $/\beta = 2.3\times10^{-3}$? pc

W.Rubinson, J.J.Howland, Jr., Phys. Rev. 96, 1610 (1954).

Cl^{32} 17 15 0.31s

τ 0.28s S(23-Mev p)

N.Tyrén, P.A.Tove, Phys. Rev. 96,773(1954).

Levels $S^{32}(p,n)$ E_p = 17.6 ppl
1.0 90°, 150°
1.4
2.0

F.Ajzenberg, A.Rubin, J.G.Likely, Phys. Rev. 99(1955); BAPS 30, #3(Washington), TA3(1955); verbal report.

Cl^{34} 17 17 1.53s

τ_2 1.53s 2 Cl^{35} ($\leq$ 22-Mev γ,n)

R.M.Kline, D.J.Zaffarano, Phys. Rev. 96, 1620 (1954).

Cl^{34} 17 17 1.53s

Levels $S^{34}(p,n)$ E_p = 17.6 ppl
g.s.? Q = 6.1 90°, 150°
1.1 4.6
1.9 5.7 ?
2.7 7.2 ?
3.7

n group with Q = -5.0 also found in S target containing C and O

F.Ajzenberg, A.Rubin, J.G.Likely, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), TA3(1955); verbal report.

Cl^{35} 17 18 stable

Levels $S^{(32)}(\alpha,p)$ E_α = 8.1
g.s. Q = -2.3 scin
0.7 ?
1.1
1.7 ?

G.F.Pieper, G.S.Stanford, P. von Herrmann, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), RA13.

Cl^{36} 17 19 4.4×10^5y

μ +1.32 6 Mic

P.C.Fletcher, L.C.Aamodt, Phys. Rev. 99(1955); BAPS 30, #3(Washington), BA10(1955).

μ +1.2838 2 I

P.B.Sogo, C.D.Jeffries, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), BA9(1955).

Resonances $Cl^{35}(n)$ E_n = 2 to 200 kev Li(p,n)

E_o (kev)	Γ (kev)
26.5	0.34
141	
190	

L.A.Toller, J.R.Patterson, H.W.Newson, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), F1 (1955).

Cl^{38} 17 21 37.3m

Resonances $Cl^{37}(n)$ E_n = 2 to 200 kev Li(p,n)

E_o (kev)	Γ (kev)
8.8	0.09
26.5	0.33
47.4	0.20
55.5	0.18
65.0	0.18
94.2	0.80
141	
190	

L.A.Toller, J.R.Patterson, H.W.Newson, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), F1 (1955).

A 18

A^{36}/A^{38} variation of > 300% in radioactive ores attributed to $Cl^{35}(\alpha,p)$

G.W.Wetherill, Phys. Rev. 96, 679 (1954).

A^{37} 18 19 34d

E_{dis} 0.812 8 recoil

O.Kofoed-Hansen, Phys. Rev. 96, 1045 (1954).

A^{37} 18 19 34^d

E_{recoil} (A^{37} ions) = 9.8 ±0.7 ev
Consistent with $E_\nu = E_{dis} = 0.816$

A.H.Snell, F.Pleasonton, Phys. Rev. 97, 246 (1955); Phys. Rev. 98 (1955); BAPS 30, #1 (New York), N6 (1955).

A^{40} 18 22 stable

Levels	$A^{(40)}(p,p')$	E_p = 9.51	ppl
g.s.	$\sigma(\theta)$ has a max. at 120°		
1.48 *2*	σ asymmetric about 90°		

R.G.Freemantle, D.J.Prowse, A.Hossain, J.Rotblat, Phys. Rev. 96, 1270 (1954).

K^{38} 19 19 0.94^s

τ_1 0.935[S] *25* $K^{(39)}$ (≤22-Mev γ,n)

R.W.Kline, D.J.Zaffarano, Phys. Rev. 96, 1620 (1954).

K^{39} 19 20 stable

μ 0.39094 *8* KF I
$\nu(K^{39})/\nu(N^{14}) = 0.64588$ *6*

L.C.Brown, D.Williams, Phys. Rev. 98 (1955). BAPS 30, #2 (Baltimore), G3.

Levels	$A^{36}(\alpha,p)$	E_α = 7.4	ppl
g.s.	Q = -1.12 ±0.03*		
2.48 *3*+			
2.88 *3*+			

R.B.Schwartz, J.W.Corbett, W.W.Watson, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), TA4 (1955); *verbal report.

K^{40} 19 21 1.3×10^9y

τ_β 9.6×10^{8} *9* 42 β's/sec/g K

A.Nee, A.Coche, P.Keller, M.Jarovoy, M.Wack, Ann. geophys. 10, 19 (1954).

$\epsilon/\beta = 0.085 \pm 0.005$
From A^{40}/K^{40} measurements using Pb/U ages and assuming 29.5 β's/sec/gm K

G.J.Wasserburg, R.J.Hayden, Phys. Rev. 97, 86 (1955).

K^{42} 19 23 12.5^h

γ	10†*	(0.309)
	100†*	(1.51)
$\gamma\gamma(\theta)$	J = 4, 2, 0	

*Disagrees with results of Lazar and Bell [see NSA 8, 24B (1954)]

V.Cappellier, R.Klingelhöfer, Z. Naturf. 9a, 1052 (1954).

K^{42} 19 23 12.5^h

Resonances

$K^{41}(n)$ E_o (kev)	E_n = 2 to 120 kev Γ(kev)	Li(p,n)
10		
23		
39	0.9	
58		
96		
110		

L.A.Toller, J.R.Patterson, H.W.Newson, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), F1 (1955).

K^{43} 19 24 22^h

β^-	20%	0.24	Ta^{181}(340-Mev p)	a
	80%	0.80		
γ	100†	0.375 *10*		scin
	~100†	0.615 *10*		

W.E.Nervik, G.T.Seaborg, Phys. Rev. 97, 1092 (1955).

Levels	$A^{40}(\alpha,p)$	E_α = 7.4	ppl
g.s.	Q = -3.18 ±0.03*		
0.62 *3*+			
1.12 *5*+			

$\sigma[A^{40}(\alpha,p)]/\sigma[A^{36}(\alpha,p)] \sim 1/35$

R.B.Schwartz, J.W.Corbett, W.W.Watson, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), TA4 (1955); *verbal report.

Ca^{39} 20 19 0

τ 0.90[S] *1* $Ca^{(40)}$ (≤19.5-Mev γ,n)

R.W.Kline, D.J.Zaffarano, Phys. Rev. 96, 1620 (1954).

Ca^{40} 20 20 stable

Level	$Ca^{(40)}(p,p' + e^+e^-)$	E_p = 4.84
3.46 *10*	J = 0	sl pr

T.W.Bonner, R.D.Bent, J.W.McCrary, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), X9.

Ca^{42} 20 22 stable

Levels	$K^{39}(\alpha,p)$	E_α = 8.2	
g.s.	Q = -0.19 *7*		a
1.51 *5*		3.02 *5*	
1.95 *7*		3.30 *10**	
2.29 *5*		3.75 *7*	
2.59 *7*		4.09 *10**	

*Observed only with E_α = 7.75

J.P.Schiffer, Phys. Rev. 97, 428 (1955).

Ca^{43} 20 23 stable

Levels	$Ca^{42}(d,p)$	E_d = 7	sm
	Level	l_n	
70†*	g.s.	3	
<10†	0.37		
40†	0.595	1	
80†	0.993	3 (2 possible)	
v st	1.95	0*	

No 0.84 level (<5†)*
†Relative intensity at peak

C.K.Bockelman, C.M.Braams, W.W.Buechner, D.B. Guthe, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), TA5(1955); *verbal report.

Ca^{44} 20 24 stable

Levels $Ca^{43}(d,p)$ $E_d = 4.15$

g.s.	Q = 9.07 7	a
1.15		
2.28		

At 90° $\sigma[Ca^{40}(d,p)]/\sigma[Ca^{43}(d,p)] \sim 50$ for g.s. groups and ~ 100 for 1st excited state groups; $\sigma[K^{41}(\alpha,p)]/\sigma[Ca^{43}(d,p)] \sim 70$ a

$K^{41}(\alpha,p)$ $E_\alpha = 8.2$

g.s.	Q = 0.98 *10*	a
1.13 *5*	2.58 *5*	
1.92 *5*	2.97 *5*	
2.28 *5*	3.17 *5*	

J.P.Schiffer, Phys. Rev. 97, 428 (1955).

Ca^{47} 20 27 4.8^d

τ		4.7^d *2*	Ca^{46}(slow n,γ)	chem
			V(380-Mev p)	chem
β^-	83%	0.660 *10*		sl
	17%	1.940 *20*		
γ	1+	0.48 *2*		scin
	1+	0.83 *2*		
	~13+	1.31 *2*		

No 0.150γ, 0.160γ, 0.234γ
(0.48γ)(0.83γ) No(1.31γ)γ scin

L.J.Lidofsky, M.Benczer, V.K.Fischer, Phys. Rev. 99(1955); BAPS 30, #3(Washington), V2 (1955); verbal report.

Ca^{48} 20 28

$\tau_{\beta\beta}$	1.6×10^{17}y 7	84%	Ca^{48}
$E_{\beta\beta}$	4.1 *3*		scin

$E_{\beta\beta}$ shows peak at 4.1 suggesting $\beta\beta$ decay without ν's

J.A.McCarthy, Phys. Rev. 97, 1234 (1955).

Sc^{40} 21 19 0.22^s

τ $\sim 0.35^s$ $Ca^{(40)}$(23-Mev p,n)

M.Tyrén, P.A.Tove, Phys. Rev. 96, 773(1954).

Sc^{41} 21 20 0.87^s

Levels $Ca^{(40)}(d,n)$ $E_d = 4.18$

g.s.	Q = -0.60 *5*
0.82*	2.05
1.07*	2.25
1.74	ppl 0°, 30°, 45°, 90°

*Assignment uncertain

M.S.Plendl, F.E.Steigert, Phys. Rev. 98 (1955). BAPS 30, #2 (Baltimore), G8; verbal report.

Sc^{44} 21 23 2.4^d

γ 0.27 $\alpha = 0.139$* E4(M4 ?)

J.W.Blue, E.Bleuler, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), V3(1955); *verbal report.

Sc^{44} 21 23 4.0^h

β^+	94%	1.47		sl
ϵ	6%			$\gamma\gamma^\pm/\gamma^\pm$,$Na^{22}$
γ	100%	1.159	$\alpha = 6.3\times10^{-5}$	scin
	0.12%	2.54		

No 1.38γ (<0.5%)
(1.16γ)$\gamma^\pm$
Origin of 4% soft e's (attributed to IB; Bruner, Phys. Rev. 84, 282) questioned

J.W.Blue, E.Bleuler, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), V3(1955); verbal report.

Sc^{45} 21 24 stable

Levels $Sc^{45}(p,p')$ $E_p = 5.03$ scin

0.377 *5*	1.235 *5*
0.541 *5*	1.409 *5*
0.722 *5*	1.432 *5*
0.972 *5*	1.661 *5*

G.C.Phillips, C.R.Gossett, J.P.Schiffer, P.M. Windham, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), TA8(1955).

Sc^{46} 21 25 84^d

Resonances $Sc^{45}(n)$ E_n = 0.0015 to 5000 ev

-0.13 *3* kev		Γ_n = 840 ± 25 mv
		Γ_γ = 250 ± 10 mv
3.6	Γ = 180 ev	$\sigma_0\Gamma^2 \sim 3\times10^7$

slow and fast chopper, cryst

M.J.Pattenden, Proc. Phys. Soc. 68A, 104(1955).

Sc^{47} 21 26 3.43^d

β^-	74%	0.450 *5*	d 4.8^{d}Ca chem;	sl
	26%	0.610 *5*		
γ	100+	0.160 *5*		scin

No other γ with $E_\gamma > 0.16$ (<0.01+)
β(0.160γ) scin

L.J.Lidofsky, M.Benczer, V.K.Fischer, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), V2 (1955); verbal report.

Ti 22

Relative abundances

Ti^{46}	7.99	Ti^{49}	5.46
Ti^{47}	7.32	Ti^{50}	5.25
Ti^{48}	73.99		

J.E.Hogg, Can. J. Chem. 32, 1039 (1954).

γ Ti(n,?γ) $E_n = 3.2$ scin

st	0.92
	1.30
	2.2

V.E.Scherrer, B.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

Ti^{43} 22 21 0.58^s

τ 0.58^s Ti(80-Mev p)

M.Tyrén, P. A.Tove, Phys. Rev. 96,773 (1954).

Ti^{44} 22 22 $\geq 23^{y}$

τ $\geq 23^{y}$ Sc^{45}(30-Mev p,2n) chem
γ 0.16 scin
p 4.0^{h}Sc chem Not p 2.4^{d}Sc

R.A.Sharp, R.W.Diamond, Phys. Rev. 93, 358 (1954); " 96, 1713 (1954).

Ti^{46} 22 24 stable

Level $Ti^{(46)}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.0$; scin
γ 0.890 *14* $\tau_\gamma(E2) = 1.8\times10^{-12}$s*

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 99 (1955); BAPS 30, #3 (Washington), CA10(1955); *verbal report.

Ti^{47} 22 25 stable

Level $Ti^{47}(\alpha,\alpha'\gamma)$ $E_\alpha = 1.2$ to 3.4
γ 0.160 $\epsilon B(E2) = 0.047$ scin
Previously reported 0.433 γ not in Ti*

G.M.Temmer, N.P.Heydenburg, Phys. Rev. 96, 426 (1954); 93, 351 (1954); *priv. comm.

Ti^{48} 22 26 stable

Level $Ti^{(48)}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.0$; scin
γ 0.990 *15* τ_γ (E2) $= 1.5\times10^{-12}$s*

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 99 (1955); BAPS 30, #3 (Washington), CA10(1955); *verbal report.

Ti^{49} 22 27 stable

Levels $Ti^{(48)}(d,p)$ $E_d = 2.6$
~0.5* (g.s.) ppl
6* (1.35)
4* (1.70)
~2* (2.41)
*σ in units of 10^{-4} barns
d,p(θ) of groups to 1.40 and 1.74 levels suggest stripping (with coulomb effects) rather than compound nucleus formation

W.W.Pratt, Phys. Rev. 97, 131 (1955).

Ti^{51} 22 29 5.8^{m}

Ti^{50}(pile n,γ)
β^- 1.8 a β(0.92 γ)
2.3 a β(0.32 γ)
γ 100† (0.32) scin
1† 0.610 *15*
5† 0.920 *15*
(0.32 γ)(0.61 γ) No (0.32 γ)(0.92 γ)
No β^- to g.s. (<15%) β(0.32 γ)/β

W.C.Jordan, S.B.Burson, J.N.Lebiano, Phys. Rev. 96, 1582 (1954).

V 23

Resonances V(n) E_n = 2 to 100 kev

E_o(kev)	E_o(kev)	Li(p,n)
4.1	22.2	
6.6	69.1	J = 4
11.5	87.1	J = 3
16.6		

Other weaker resonances with $22 < E_o < 70$

H.Marshak, H.W.Newson, Phys. Rev. 98 (1955); BAPS 30, #1 (New York), HA9, (1955).

V^{46} 23 23 0.4^{s}

τ 0.4^{s} Ti(23-Mev p)
See also Cr^{47} V(57-Mev p)

H.Tyrén, P. A.Tove, Phys. Rev. 96, 773(1954).

V^{47} 23 24 31.1^{m}

τ 31^{m} *1* Ti(13-Mev d)
β^+ 1.89 *1* F-K plot linear al
No ce 0.16 γ (<0.08% of β^+)
No pe (0.05 to 0.21 Mev)

H.Daniel, Z. Naturf. 9a, 974 (1954).

V^{49} 23 26 334^{d}

τ 327^{d} *20* $Ti^{(48)}$(15-Mev d,n) chem
No 0.080 γ, 0.120 γ, 0.128 γ pc, scin
E_ϵ = 0.622 *10* γ continuum
Shape of γ continuum in agreement with theory by Glauber and Martin

R.W.Hayward, D.D.Hoppes, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), V4(1955); verbal report.

τ 334^{d} *20* Cr(22-Mev p) chem
x Ti K x rays pc
No β^+ (<0.05%) GM, scin
No γ with $0.51 > E_\gamma > 0.03$ (<0.05%) scin
No ce GM

W.S.Lyon, Phys. Rev. 97, 121 (1955).

V^{50} 23 27 stable

τ $>3\times10^{15}$y GM, pc
Absence of 1.6 γ, 1.2 β^-, 1.4 β^+, Ti K x rays gives $\tau > 3\times10^{15}\gamma$, $3\times10^{14}\gamma$, 10^{15}y, 3×10^{14}y resp.

J.Meintze, Z. Naturf. 10a, 77 (1955).

V^{51} 23 28 stable

γ $V^{51}(\alpha,\alpha'\gamma)$ $E_\alpha = 3.4$
0.320 $\epsilon B(E2) = 0.013$ scin
Large departure from theoretical E2 excitation curve

G.M.Temmer, N.P.Heydenburg, Phys. Rev. 96, 426 (1954).

Cr 24

γ Cr(n,?γ) $E_n = 3.2$ scin

0.03†	0.75
0.10†	0.97
0.73†	1.43

†σ in barns

V.E.Scherrer, B.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

Cr^{46}? 24 22

τ 1.1^{s} V(57-Mev p)
Cr(165-Mev p)

H.Tyrén, P.A.Tove, Phys. Rev. 96, 773(1954).

Cr^{47}? 24 23

τ 0.4^s V(57-Mev p)
See also V^{46} and Mn^{49} Cr(100-Mev p)

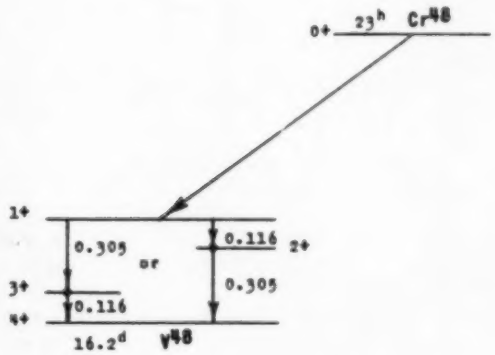
H.Tyrén, P. A.Tove, Phys. Rev. 96, 773(1954).

Cr^{48} 24 24 23^h

τ 24^h *1* Ti^{46}(50-Mev α,2n) chem
γ 100† 0.118 scin
~100† 0.307
(0.118 γ)(0.307 γ) Σscin
No other γ No β^+ (<2%) p 16.2^{d}V

J.R.Wilkinson, R.K.Sheline, Phys. Rev. 98, (1955).
BAPS 30, #2 (Baltimore), 69; verbal report.

τ 23^h *1* Ni(380-Mev p) chem
p 16.2^{d}V
γ 95† 0.116 *4* α~0.02 M1 } sl ce
100† 0.305 *10* α~0.006 E2 } scin
No β^+ (<2%), no other γ's (<0.2%)
(0.116 γ)(0.305 γ) scin



R. van Lieshout, D.M.Greenberg, C.S.Wu, Phys. Rev. 98 (1955).
BAPS 30, #1(New York), MA1

Cr^{51} 24 27 27^d

γ 0.325 *5* M1 sl ce, Cp
$\alpha = 1.45 \pm 0.15 \times 10^{-3}$

Z.O'Friel, A.H.Weber, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), V5(1955); verbal report.

Level $Ti^{48}(\alpha,n\gamma)$ E_α = 6.0
$V^{51}(p,n\gamma)$
γ 0.750 *11* scin

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 99 (1955); BAPS 30, #3 (Washington), CA10(1955);

Mn^{49}? 25 24

τ 0.4^s Cr(100-Mev p)
See also Cr^{47}

H.Tyrén, P. A.Tove, Phys. Rev. 96, 773(1954).

Mn^{50} 25 25 0.3^s

τ 0.26^s Cr(45-Mev p)
0.28 Mn^{55}(95-Mev p)

H.Tyrén, P. A.Tove, Phys. Rev. 96, 773(1954).

Mn^{52} 25 27 5.72^d

τ 5.72^d *2* $Cr^{(52)}$(15-Mev d,2n)
Counted for 104 days chem

E.W.Backofen, H.H.Herber, Phys. Rev. 97, 743 (1955).

β^+/ϵ = 0.47 ± 0.05 $\gamma^+\gamma^\pm/\gamma$ GM

R.Sehr, Z.Phys. 137, 523 (1954).

Mn^{54} 25 29 291^d

τ 291^d *1* $Cr^{(54)}$(15-Mev d,2n)
Counted for 104 days chem

E.W.Backofen, H.H.Herber, Phys. Rev. 97, 743 (1955).

τ 280^d *10* $Cr^{(54)}$(d,2n)
From analysis of decay of 20 samples

P.Kafalas, Thesis, MIT August 1954.

γ (0.835) $Fe^{(56)}$(d,α) chem
Anisotropy up to 90% in $\gamma(\theta,T)$ shows 0.835 γ is not dipole and that angular momentum of $e^- + \nu$ is the minimum for given J_i and J_f

N.A.Grace, C.E.Johnson, H.Kurti, H.R.Lemmer, F.N.H.Robinson, Phil. Mag. 45, 1192 (1954).

γ (0.835) $Fe^{(56)}$(d,α) chem
Polarization as $f(\theta,T)$ shows that if quadrupole, 0.835 γ is E2

G.R.Bishop, J.M.Daniels, H.Durand, C.E.Johnson, J.Perez, Phil. Mag. 45,1197 (1954).

Mn^{55} 25 30 stable

q +0.6 MnO_3F Nic
q coupling compared with that for ReO_3Cl

A.Javan, A.Engelbrecht, Phys. Rev. 96, 649 (1954).

Level $Mn^{55}(\alpha,\alpha'\gamma)$ E_α = 1.1 to 3.4
γ 0.128 $\epsilon B(E2)$ = 0.070 scin
$Mn^{55}(\alpha,\alpha'\gamma)$ E_α = 1.86
$Mn^{55}(p,p'\gamma)$ E_p = 0.75
γ 0.128 E2 from α yield/p yield

G.M.Temmer, N.P.Heydenburg, Phys. Rev. 96, 426 (1954); 93, 351 (1954).

Level $Mn^{55}(n,n'\gamma)$ E_n = 0.2 to 1.0
γ 0.128 *2* J = 7/2

D.A.Lind, J.J.Van Loef, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), F8(1955); Phys. Rev. 98, 224A (1955).

Mn^{55} 25 30 stable

Level $Mn^{55}(p,p'\gamma)$ $E_p = 3.60$
γ 0.128 SΣ ce

E.M.Bernstein, H.W.Lewis, Phys. Rev. 99(1955); BAPS 30, #3(Washington), CA7 (1955).

Level $Mn^{55}(p,p')$ $E_p = 4.6$ to 5.7 SΣ
0.128 7

J.P.Schiffer, F.W.Windham, C.R.Gossett, G.C. Phillips, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), TA9 (1955).

γ $Mn^{55}(n,n'\gamma)$ $E_n = 0.7$ to 1.3
st 0.126 3 scin
20† 0.853 7*
1† ~0.98
*Graph of σ from threshold (0.98) to 1.3

J.M.Freeman, Phil. Mag. 46, 12 (1955).

γ $Mn^{55}(n,?\gamma)$ $E_n = 3.2$ scin

0.58		1.50	
0.67	st	1.86	
st 0.83	st	2.2	
1.16			

V.E.Scherrer, B.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

Mn^{56} 25 31 2.58h

Resonances $Mn^{55}(n,n'\gamma)$ $E_n = 0.98$ to 1.3
Graph of yield of 0.853γ scin

J.M.Freeman, Phil. Mag. 46, 12 (1955).

Resonances $Mn^{55}(n)$ $E_n = 2$ to 100 kev

E_o (kev)		E_o (kev)	
2.4	J = 3	21.2	
7.3		27.3	
9.0		35.1	J = 3

Other weak resonances present Li(p,n)

H.Marshak, H.W.Newson, Phys. Rev. 98, (1955); BAPS 30, #1 (New York), HA9, (1955).

Fe 26

γ Fe(n,n'γ) $E_n = 2.7$ scin

0.462	1.42
0.634	1.59
0.851	1.76
0.989	2.10
1.24	2.66

D.L.Lafferty, L.A.Rayburn, T.W.Hahn, Phys. Rev. 96, 381 (1954); 95, 301A, 637A(1954).

γ Fe(n,n'γ) $E_n = 3.2$ scin

1.18†	0.84
0.39†	1.17
0.33†	1.67

†σ in barns

V.E.Scherrer, B.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

Fe 26

γ Fe(n,n'γ) $E_n = 4.4$ scin

0.85	2.1
1.20	2.5
1.73	3.0

R.N.Sinclair, Phys. Rev. 98 (1955). BAPS 30, #1, (New York), A2; verbal report.

Fe^{54} 26 28 stable

Level $Fe^{54}(n,n'\gamma)$ $E_n = 4.4$
γ 1.40 2* scin
No other γ with $E_\gamma < 3.0$

R.N.Sinclair, Phys. Rev. 98(1955). BAPS 30, #1 (New York), A2; *verbal report.

Level $Fe^{54}(p,p')$ $E_p \leq 5.7$ SΣ
1.413 5

G.C.Phillips, C.R.Gossett, J.P.Schiffer, F.W. Windham, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), TA8 (1955).

Fe^{55} 26 29 2.9y

Level $Fe^{54}(d,p)$ $E_d = 10$ a
g.s. Q = 7.18 7

C.E.McFarland, F.B.Shull, A.J.Elwyn, B.Zeldman, Phys. Rev. 99(1955); BAPS 30, #3(Washington), TA6(1955); priv. comm.

Fe^{56} 26 30 stable

Level $Fe^{(56)}(p,p')$ $E_p = 17$
~40* (0.84)
*σ in mb
Angular distribution and σ suggest applicability of the direct interaction theory [see Phys. Rev. 92,350(1953)]

G.Schrank, P.C.Gugelot, I.E.Dayton, Phys. Rev. 96, 1156 (1954).

Level $Fe^{(56)}(n,n'\gamma)$ $E_n = 0.7$ to 1.3
γ 0.841 5 scin
Graph of σ from threshold to 1.3

J.M.Freeman, Phil. Mag. 46, 12 (1955).

Level $Fe^{56}(p,p')$ $E_p \leq 5.7$ SΣ
0.845 5

G.C.Phillips, C.R.Gossett, J.P.Schiffer, F.W. Windham, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), TA8(1955).

Level $Fe^{(56)}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.0$; scin
γ 0.854 13 $\tau_\gamma(E2) = 2.9 \times 10^{-12}$s*

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 99 (1955); BAPS 30, #3(Washington), CA10(1955); *verbal report.

Fe^{56} 26 30 stable

Levels	$Fe^{56}(n,n')$	$E_n = 4.4$		
0.04†	0.85	0.01†	2.7	ppl
0.02†	2.05	0.02†	3.1	

†$d\sigma/d\omega$ (90°)

J.B.Weddell, B.Jennings, R.L.Heilens, Phys. Rev. 99(1955); BAPS 30,#3(Washington), F6 (1955); verbal report; Phys. Rev. 95, 636A (1954).

Fe^{57} 26 31 stable

Levels	$Fe^{57}(\alpha,\alpha'\gamma)$	$E_\alpha = 3.5$	
γ	(0.014)		scin
	0.123*		
	(0.137)	$\epsilon B(E2) = 0.043$	

*Excitation function suggests γ emitted from 0.137 level

G.M.Temmer, N.P.Heydenburg, Phys. Rev. 96, 426 (1954); 93, 351 (1954); 95, 629A (1954).

Levels	$Fe^{56}(d,p)$		$E_d = 10$	a
	Level	l_n		
6†	g.s.	1	Q = 5.49 6	
2†	1.24 6	1		
1†	1.65 6			
10†	2.46 6			
3†	3.23 6			
3†	4.11 10			

Level	$Fe^{57}(d,p)$	$E_d = 10$
	g.s. $l_n = 1$	

C.E.McFarland, F.B.Shull, A.J.Elwyn, B.Zeldman, Phys. Rev. 99(1955); BAPS 30, #3(Washington), TA6(1955); priv. comm.

Resonances	$Fe^{56}(n,n'\gamma)$	$E_n = 0.7$ to 1.3
Graph of yield of 0.841 γ		scin

J.W.Freeman, Phil. Mag. 46, 12 (1955).

Fe^{58} 26 32 stable

Levels	$Fe^{57}(d,p)$		$E_d = 10$	a
	Level	l_n		
1†	g.s.	1	Q = 7.89 7	
8†	0.79 7	1		
25†	1.62 6	1		
50†	2.67 7	1		
50†	4.21 7	1		

C.E.McFarland, F.B.Shull, A.J.Elwyn, B.Zeldman, Phys. Rev. 99(1955); BAPS 30, #3(Washington), TA6(1955); priv. comm.

Co^{54} 27 27 0.2[s]

τ	0.20[s]	Fe (23-Mev p)
See also Cu^{57}		Ni (60-Mev p)

H.Tyrén, P.A.Tove, Phys. Rev. 96, 773(1954).

Co^{57} 27 30 270[d]

β^+	vw (may be impurity)		$\gamma^\pm$ GM, scin
ϵ	100%	K x ray	Σscin, scin
γ	~100%*	0.014	α not low*
	~100%	0.120	$\alpha < 0.1$

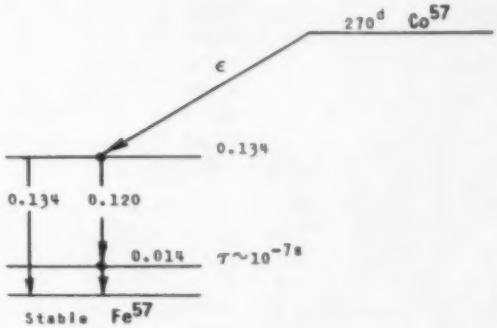
(0.014 γ)(0.120 γ) delay $\sim 10^{-7}$s
(0.014 γ) x observed*

L.Madansky, F.Rasetti, Phys. Rev. 97, 837 (1955); *priv. comm. April (1955).

Ni[58](22-Mev p,2p) chem

No β^+ ($< 2\times10^{-3}$%)			sl, scin
γ	1*	0.123 2	scin, sl ce
	1*	0.137 2	

No other γ's with $0.05 < E_\gamma < 0.8$ scin
*Relative intensities of ce



B.Crasemann, D.L.Manley, Phys. Rev. 98, 66 (1955).

Co^{59} 27 32 stable

γ	$Co^{59}(n,?\gamma)$		$E_n = 3.2$	scin
0.20†	0.60	0.15†	1.7	
0.82†	1.15	0.19†	2.5	
0.53†	1.49			

†σ in barns

V.E.Scherrer, B.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

Co^{60} 27 33 5.2[y]

β^-	0.309 3	sl
F-K plot linear above 0.056		

G.Bolla, S.Terrani, L.Zappa, Nuovo Cim. 12, 875 (1954).

$\beta\gamma$ and $\gamma\gamma$ delay $< 10^{-11}$s scin

Z.Bay, V.P.Henri, F.McLernon, Phys. Rev. 97, 561 (1955); 94, 780A (1954).

No delayed $\beta\gamma$ ($\tau_\gamma < 5\times10^{-10}$s)

V.I.Winteratelger, Bull. Inst. Nuclear Sci., Boris Kidrich 4, 79 (1954).

Co^{60} 27 33 5.2^{y} — $\gamma\gamma(\theta)$ from paramagnetic crystal source same at 288°K and 20°K

H.R.Lemmer, W.A.Grace, Proc. Phys. Soc. 67A, 1051 (1954).

Levels	$Co^{59}(d,p)$ Q = 5.283	E_d = 5	577 90°
g.s.			
0.060 *3*		2.610 *6*	
0.286 *3*		2.624 *6*	
0.445 *3*		2.786 *9*	
0.513 *3*		2.870 *13*	
0.557 *5*		2.924 *9*	
0.622 *4*		3.038 *9*	
0.792 *3*		3.120 *9*	
1.012 *3*		3.138 *9*	
1.237 *5*		3.208 *9*	
1.394 *4*		3.288 *9*	
1.533 *6*		3.304 *9*	
1.663 *6*		4.221 *9*	
1.825 *6*		4.302 *10*	
2.005 *6*		4.421 *10*	
2.065 *6*		4.494 *13*	
2.154 *6*		4.533 *13*	
2.295 *6*		4.571 *13*	
2.370 *13*			

G.M.Fogiesong, D.G.Foxwell, Phys. Rev. 96, 1001 (1954).

Resonances	$Co^{59}(n)$ E_o(kev)	E_n = 2 to 100 kev L1(p,n)
	5.4	
	7.8	
	28.3	

N.Marshak, H.W.Newson, Phys. Rev. 98, (1955); BAPS 30, #1 (New York), HA9.(1955).

Ni 28 — γ — $Ni(n,?\gamma)$ — E_n = 3.2 scin

0.05†	0.59	0.54†	1.49	
0.84†	1.33	0.01†	2.7	

†σ in barns

V.E.Scherrer, B.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

Ni^{54} 28 26 $<5^{m}$ — Not observed from Ni(90-Mev p) chem; $\tau < 5^{m}$

R.W.Fink, Thesis, Univ. of Rochester (1953).

Ni^{55} 28 27 $<5^{m}$ — Not observed from Ni(90-Mev p) chem; $\tau < 5^{m}$

R.W.Fink, Thesis, Univ. of Rochester (1953).

Ni^{58} 28 30 stable — Level $Ni^{58}(p,p')$ E_p = 4.6 to 5.7 577

1.453 *5*

J.P.Schiffer, F.W.Windham, C.R.Gossett, G.C. Phillips, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), TA9(1955).

Ni^{59} 28 31 $7.5\times10^{4}y$ — Resonances $Ni^{58}(n)$ E_n = 2 to 270 kev L1(p,n)

E_o(kev)		E_o(kev)
5	st	162
st 17		192
st 65	st	211
109		236
124		No peak at 229 kev*
st 142		

R.C.Block, H.W.Newson, Phys. Rev. 98 (1955); BAPS 30, #1 (New York), HA10, (1955); *priv. comm.

Ni^{60} 28 32 stable — Level $Ni^{60}(p,p')$ E_p = 4.8 to 5.7 577

1.329 *5*

J.P.Schiffer, F.W.Windham, C.R.Gossett, G.C. Phillips, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), TA9(1955).

Ni^{61} 28 33 stable — Resonances $Ni^{60}(n)$ E_n = 2 to 270 kev L1(p,n)

E_o(kev)		E_o(kev)
st 15		140
st 30		162
st 67	st	188
88	st	200
99		257
109		

R.C.Block, H.W.Newson, Phys. Rev. 98 (1955); BAPS 30, #1 (New York), HA10 (1955).

Ni^{66} 28 38 56^{h} — β^- — 0.3 — Ta^{181}(340-Mev p) a

W.E.Nervik, G.T.Seaborg, Phys. Rev. 97, 1092 (1955).

Cu 29 — γ — $Cu(n,?\gamma)$ — E_n = 3.2 scin

0.21†	0.66	0.81†	1.37
0.12†	0.96	0.18†	1.9

†σ in barns

V.E.Scherrer, B.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

Cu^{57}? 29 28 — τ — 0.18^{s} — Ni(50-Mev p)

See also Co^{54}

H.Tyrén, P.A.Tove, Phys. Rev. 96, 773(1954).

Cu^{58} 29 29 3.0^{s} — τ — 3^{s} — Ni(23-Mev p)

H.Tyrén, P.A.Tove, Phys. Rev. 96, 773 (1954).

Cu^{62} 29 33 10^{m} — No γ — $Cu^{(63)}$ (< 23-Mev γ,n)

$\gamma(0.1 \le E_\gamma \le 1.2) < 0.3\%$ of $\gamma^{\pm}$ — scin

No $(0.56\gamma)\gamma^{\pm}$ — Σscin

No γ with $E_\gamma > 1.2$ — scin

J.M.Reid, T.F.Wright, Nature 175, 298 (1955).

$Cu^{63}_{29\ 34}$ stable

Q	-0.16 *3*		para

B.Bleaney, K.D.Bowers, M.H.L.Pryce, Proc. Roy. Soc. 228A, 166 (1955).

Levels $Cu^{63}(p,p')$ E_p = 4.6 to 5.7 scin

0.669 *5*	1.410 *5*
0.968 *5*	1.549 *5*
1.326 *5*	

J.P.Schiffer, P.W.Windham, C.R.Gossett, G.C. Phillips, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), TA9(1955).

$Cu^{(63)}(\gamma,n)$ E_γ = 17.55 to 17.67
Structure in giant resonance observed from yield of 10^mCu

D.P.Sunbury, Proc. Phys. Soc. 67A, 1106(1954).

$Cu^{65}_{29\ 36}$ stable

Q	-0.15 *3*		para

B.Bleaney, K.D.Bowers, M.H.L.Pryce, Proc. Roy. Soc. 228A, 166 (1955).

$Cu^{65}(p,p')$ E_p = 4.6 to 5.7 scin
No levels observed below 1.5

J.P.Schiffer, P.W.Windham, C.R.Gossett, G.C. Phillips, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), TA9(1955).

Zn_{30}

γ		Zn(n,$\gamma\gamma$)	E_n = 3.2 scin
1.3†		1.02	
0.03†		1.3	
0.02†		1.6	

†σ in barns

V.E.Scherrer, B.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

$Zn^{64}_{30\ 34}$ stable

$Zn^{(64)}(\gamma,n)$ E_γ = 17.55 to 17.67
Possible structure in giant resonance from yield of 38^mZn

D.P.Sunbury, Proc. Phys. Soc. 67A,1106(1954).

$Zn^{67}_{30\ 37}$ stable

$Zn^{67}(\alpha,\alpha'\gamma)$ E_α = 3.5

γ	0.092* (2 unresolved γ's)	scin
	0.182 $\epsilon B(E2)$ = 0.043	

*Excitation function shows γ's emitted from 0.182 level

G.M.Temmer, N.P.Heydenburg, Phys. Rev. 96, 426 (1954); 93, 351 (1954).

$Zn^{69}_{30\ 39}$ 14^h

γ	0.435	α = 0.053 M4	sl

A.B.Smith, Dissertation Abstr. 13,849(1953).

$Zn^{69}_{30\ 39}$

γ	0.435		$Zn^{(68)}$(th n,γ)
No other γ		No $\beta\gamma$	scin

J.M.LeBlanc, J.M.Cork, S.B.Burson, Phys. Rev. 97, 750 (1955).

$Zn^{69}_{30\ 39}$ 51^m

β^-	100%	0.914	d 14^hZn; sl

A.B.Smith, Dissertation Abstr. 13,849(1953).

β^-		0.85	$Zn^{(68)}$(th n,γ) a
No γ			scin

J.M.LeBlanc, J.M.Cork, S.B.Burson, Phys. Rev. 97, 750 (1955).

Levels $Zn^{68}(d,p)$ E_d = 11.9 scin

100†	g.s.	Q=4.16 *15*	l_n = 1 d,p(θ)
40†	(0.435)		l_n = 4
125†	0.77		l_n = 2?
	1.6		

†Relative numbers at forward peaks

F.S.Eby, Phys. Rev. 96, 1355 (1954); 93, 923A (1954).

$Zn^{71}_{30\ 41}$ 3^h

τ_1	3^h		Zn^{70}(pile n,γ)
β^-	1.5 *1*		a$\beta\gamma$
γ	0.38		scin $\beta\gamma$
	0.49*		scin $\beta\gamma$
	0.61		scin $\beta\gamma$

*Not same as 0.51γ of 2.2^mZn (ΔE_γ = 0.03)
(1.5β)(0.38γ, 0.49γ, 0.61γ)
All three γ's in cascade scin $\gamma\gamma$

J.M.LeBlanc, J.M.Cork, S.B.Burson, Phys. Rev. 97, 750 (1954); 94, 1436A (1954).

$Zn^{71}_{30\ 41}$ 2.2^m

τ_2	2.2^m		Zn^{70}(pile n,γ)
β^-	2.4 *2*		a$\beta\gamma$, a
γ	0.12		scin
	0.51*		
w	0.90		
w	1.09		

*Not same as 0.49γ of 5^hZn (ΔE_γ = 0.03)
(2.4β)(0.51γ) β(0.12, 0.51, 0.90, 1.09γ)
No (0.12γ)(0.51γ)

J.M.LeBlanc, J.M.Cork, S.B.Burson, Phys. Rev. 97, 750 (1954); 94, 1436A (1954).

$Ga^{69}_{31\ 38}$ stable

μ_I	0.11 *2*		M

Interaction constant = 84 ± 6 cps

R.T.Daly, Jr., J.M.Holloway, Phys. Rev. 96, 539 (1954).

Ga^{71} 31 40 stable

μ_3 0.15 *2* M

Interaction constant = 115± 7 cps

R.T.Daly, Jr., J.H.Holloway, Phys. Rev. 96, 539 (1954).

Ge 32

γ Ge(n,n'γ) E_n = 4.4

E_γ	A	
47†	0.51*	? scin
100†	0.61	74
68†	0.84	72
42†	1.05	70
~9†	1.25	74?

*$\tau < 0.3^s$

R.W.Sinclair, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), F7(1955); verbal report.

Ge^{70} 32 38 stable

Level $Ge^{70}(\alpha,\alpha'\gamma)$ E_α = 6.5; scin

γ 1.020 *15* τ_γ(E2) = 1.4 x 10^{-12s}

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 99 (1955); BAPS 30, #3 (Washington), CA10(1955); verbal report.

Level $Ge^{(70)}$(n,n'γ) E_n = 4.4

γ 1.05 scin

R.W.Sinclair, Phys. Rev. 99(1955); BAPS 30, #3(Washington), F7(1955); verbal report.

Ge^{71} 32 39 11.4^d

$e_A(L)/e_A(K)$ = 1.26 pc

ϵ_L/ϵ_K = 0.30, 0.22 or (0.11 theory) for fluorescence yield 0.45*, 0.49** or 0.54 resp.

M.Langevin, Compt. rend. 239, 1625 (1954); *Burhop, The Auger Effect, Camb. Univ. Press p. 48 (1952); **Broyles, Thomas, Haynes, Phys. Rev. 89, 723 (1953).

Ge^{72} 32 40 stable

Level $Ge^{(72)}$(n,n'γ) E_n = 4.4

γ 0.84 scin

R.W.Sinclair, Phys. Rev. 99(1955); BAPS 30, #3(Washington), F7(1955); verbal report.

Level $Ge^{72}(\alpha,\alpha'\gamma)$ E_α = 6.0; scin

γ 0.830 *13* τ_γ(E2) = 1.3x10^{-12s}*

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 99 (1955); BAPS 30, #3(Washington), CA10(1955); *verbal report.

Ge^{73} 32 41 stable

Level $Ge^{73}(\alpha,\alpha'\gamma)$ E_α = 3.5

γ 0.068 ϵB(E2) = 0.042 scin

No 0.014 γ or 0.054 γ observed

G.M.Temmer, N.P.Heydenburg, Phys. Rev. 96, 426 (1954); 93, 351 (1954); 95, 629A (1954).

Ge^{74} 32 42 stable

Level $Ge^{74}(\alpha,\alpha'\gamma)$ E_α = 6.0; scin

γ 0.593 *9* τ_γ(E2) = 9.0x10^{-12s}*

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 99 (1955); BAPS 30, #3 (Washington), CA10(1955); *verbal report.

Level $Ge^{(74)}(\gamma,\gamma)$ As^{74} vapor

γ (0.596) J = 2 $\gamma\gamma(\theta)$

τ = 1.7x10^{-11s} σ

F.R.Metzger, Phys. Rev. 99(1955); BAPS 30,#3 (Washington), BA8(1955).

Level $Ge^{(74)}$(n,n'γ) E_n = 4.4

γ 100† 0.61 scin

~9† 1.25*

*Assigned from systematics (Phys. Rev. 98, 214)

R.W.Sinclair, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), F7(1955); verbal report.

Ge^{75} 32 43 49^s

τ 49^s *2* Ge^{74}(pile n,γ)

γ 0.1385 *10* K/LM> 3 87 ce, scin

S.B.Burson, W.C.Jordan, J.M.LeBlanc, Phys. Rev. 96, 1555 (1954); 95, 613A (1954).

Ge^{76} 32 44 stable

Level $Ge^{76}(\alpha,\alpha'\gamma)$ E_α = 6.0; scin

γ 0.566 *9* τ_γ(E2) = 1.1x10^{-11s}

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 99 (1955); BAPS 30, #3 (Washington), CA10(1955); verbal report.

Ge^{77} 32 45 52^s

τ_1 52^s *2* Ge^{76}(pile n,γ)

β^- 10* ~2.7 a $\beta\gamma$

90* (2.9) scin

γ 100† 0.159 *3*

100† 0.215 *3*

(~2.7 β)(0.215 γ) No β(0.159 γ)

No (0.159 γ)(0.215 γ) *2.7 β/2.9 β = 1/9

S.B.Burson, W.C.Jordan, J.M.LeBlanc, Phys. Rev. 96, 1555 (1954); 95, 613A (1954).

Ge^{77} 32 45 12^h

β^-	~1.3	Ge^{76}(pile n,γ)	a $\beta\gamma$
	~1.5		a $\beta\gamma$
	2.1		a $\beta\gamma$
γ	0.210 *1*	0.91 *2*	scin
	0.215 *3*	1.09 *2*	
	0.265 *1*	1.19 *2*	
	0.365 *7*	1.36 *3*	
	0.410 *8*	(1.46)*	
	0.560 *10*	(1.54)*	
	0.625 *15*	1.75 *3*	
	0.710 *15*	2.00 *5*	
	0.79 *2*	2.30 *5*	

*Unresolved

(CONTINUED)

Ge^{77} 32 45 12h

γ_a \ γ_b	~0.21	0.265	0.365	0.410	0.560	0.625
0.210		Y				
0.215				Y		
0.265	Y		Y		Y	
0.365		Y			Y	
0.410	Y	N	N		Y	
0.560	Y	Y	Y	Y		
0.625					Y	
0.79		Y	Y	Y	Y	Y
0.91	Y	Y	Y	Y	N	Y ?
1.19	N	Y	N		N	N
1.36		Y	Y	Y	N	Y
1.75						Y

Coincidences observed (Y) and not observed (N) between γ_b and indicated γ_a

No 0.300 γ, 0.327 γ, 0.428 γ, 0.466 γ
No 2.75 γ (Na^{24} impurity)
(~1.3 β)(1.09 γ) (~1.5 β)(0.56 γ)
(2.1 β)(~0.21 γ, 0.265 γ, 0.365 γ, 0.410 γ)
(1.09 γ) γ delay > $1.6^{\mu s}$

S.B.Burson, W.C.Jordan, J.M.LeBlanc, Phys. Rev. 96, 1535 (1954); 95, 613A (1954).

$As^{?}$ 33

τ	27m	Se(fast n)	chem

Possibly Se but not Ge activity

C.Ythier, G.Herrmann, Z. Elektrochem 58, 630 (1954).

$As^{68?}$ 33 35

τ	~7m	$Ge^{(70)}$ (≥40-Mev p,3n)	chem

F.D.S.Butement, E.G.Prout, Phil. Mag. 46, 357 (1955).

As^{69} 33 36 15m

τ	15m	$Ge^{(70)}$ (≥20-Mev p,2n)	chem
β^+	2.9		a

No other β^+

γ	0.23		scin

No other γ p 40^hGe chem

F.D.S.Butement, E.G.Prout, Phil. Mag. 46, 357 (1955).

As^{70} 33 37 52m

γ	0.18	$Ge^{(70)}$	(8-Mev p,n)	chem
	1.06		1.74	scin
	1.36		2.04	

F.D.S.Butement, E.G.Prout, Phil. Mag. 46, 357 (1955).

As^{71} 33 38 62h

τ	65^h 5			
	$Ge^{(70)}$	(25-Mev d,n)	chem;	ms
β^+ 3†	0.25 ?			sl
97†	0.813 *10*			
15*	0.0233 *3*	K/LM = 5.4		sl ce
21*	0.1745 *4*	K/LM = 8.9		sd ce
vw	0.535 *40* ?			scin

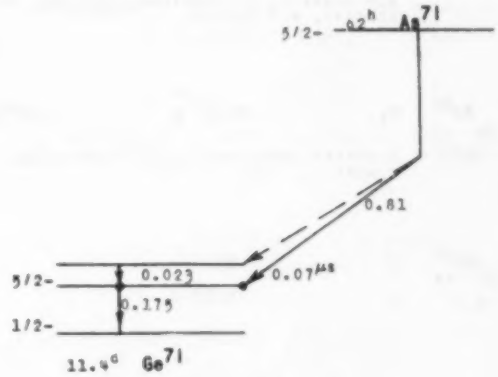
$\epsilon_K/\beta^+ = 2.1 \pm 1.0$ from $e_A/\beta^+ = 1.5$
(0.813 β)(0.175 γ) sl
(ce_K 0.023 γ)(0.175 γ) sl
*ce per 100 β^+

S.Thulin, J.Moreau, H.Atterling, Arkiv Fysik 8, 219 (1954).

As^{71} 33 38 62h

τ	62^h *3*	Ge^{70}	(11-Mev d,n)	chem
β^+	0.815 *10*			sl
γ ~2.3*	0.02300 *5*	K/LM ~1		sl ce
23*	0.1750 *3*	K : L : M = 31 : 4 : 1		
		α_K = 0.095		E2

$\gamma^{\pm}$(0.175 γ) delay = $0.07^{\mu s}$
*ce per 100 β^+



W.E.Graves, A.C.G.Mitchell, Phys. Rev. 97, 1033 (1955).

As^{79} 33 46 9m

τ	9.1m	Se(fast n)	chem
		p 3.9m Se	chem

C.Ythier, G.Herrmann, Z. Elektrochem. 58, 630 (1954).

$As^{80?}$ 33 47

τ	~36s	$Se^{(80)}$	(fast n,p) chem

C.Ythier, G.Herrmann, Z. Elektrochem. 58, 630 (1954).

Se^{73} 34 39 7.1h

		$Ge^{(70)}$	(30-Mev α,n)	chem
β^+	100†*	1.29 *1*		
	≤1†*	1.65 *1*		sl
γ	29.8**	0.0659 *2*	K/LM = 10.2	Mi sl ce
			$\tau < 5\times10^{-9}$s	$\gamma\gamma$
	1.4**	0.359 *1*	$\tau = 6.0\times10^{-8}$s M2	$\gamma^{\pm}\gamma$

No 0.86 γ, 1.31 γ (< 1%) scin
(0.359 γ)(0.066 γ) $\gamma^{\pm}$(0.066 γ, 0.359 γ)
*$\sigma^{\mu s}$ delay for ≥ 99% of $\gamma^{\pm}$ (0.066 γ)
**ce per 100 β^+

R.W.Hayward, D.D.Hoppes, Phys. Rev. 98 (1955). BAPS 30, #1(New York), MA2; verbal report.

Se^{75} 34 41 127d

Highest energy sum peak at 0.405 is strongest
(0.138 γ)(0.269 γ) No (0.098 γ)γ Σ scin
No (0.077 γ)(0.269 γ) Possible (0.124 γ)γ

D.C.Lu, W.H.Kelly, M.L.Wiedenbeck, Phys. Rev. 97, 139 (1955).

Se^{79} 34 45 3.9m

τ_1	3.91m 5	$Br^{(79)}$	(fast n,p)	chem

C.Ythier, G.Herrmann, Z. Elektrochem. 58, 630 (1954).

Se^{81} 34 47 57^m

τ_1 56.8^m *2* $Br^{(81)}$(fast n,p) chem

C.Ythier, G.Herrmann, Z. Elektrochem. 58, 630 (1954).

γ ~0.100 K/L = 4.0 ±0.2 s ce
α_K = 8.6 ±2.4 E37

G.M.Drabkin, L.I.Ruslnov, Doklady Akad. Nauk SSSR 97, 417 (1954).

Se^{81} 34 47 18^m

τ_2 18.2^m *2* d 57^mSe chem

C.Ythier, G.Herrmann, Z. Elektrochem. 58, 630 (1954).

Rb^{81} 37 44 4.7^h

J 3/2 M

μ 2.00 *6*

J.F.Hobson, J.C.Hubbs, W.A.Nierenberg, H.B.Silsbee, Phys. Rev. 96, 1450 (1954); Phys. Rev. 99(1955); BAPS 30, #3 (Washington), BA4 (1955).

Rb^{85} 37 48 stable

Q +0.31 M

B.Senitzky, I.I.Rabi, M.L.Perl, Phys. Rev. 98 (1955).
BAPS 30, #2 (Baltimore), G2.

Q +0.29 *2* M

H.Kruger, U.Meyer-Berkhout, Naturwiss. 42, 94 (1955).

Rb^{86} 37 49 19.5^d

J 2 M

μ -1.69 *1*

E.H.Bellamy, K.F.Smith, Phil. Mag. 44, 33 (1953); Nature 168, 556(1951).

β^- 0.715 *10* sl $\beta\gamma$
1.798 $\Delta J = 2$, yes shape sl

R.S.Caird, A.C.G.Mitchell, Phys. Rev. 94, 412 (1954).

Levels Rb^{85}(d,p) E_d = 15.1
g.s. ? Q = 6.2 *3* scin
1.5 ?

M.S.Wall, Phys. Rev. 96, 664 (1954).

Rb^{87} 37 50 6.2×10^{10y}

τ 4.3×10^{10y} GM

Corrections for backscattering and absorption

I.Geese-Bähnisch, E.Huster, Naturwiss. 41, 495 (1954).

Rb^{87} 37 50 6.2×10^{10y}

Q +0.14 *1* M

H.Kruger, U.Meyer-Berkhout, Naturwiss. 42, 94 (1955).

$Q(Rb^{85})/Q(Rb^{87})$ = 2.0669 *5* M
Implies Q = +0.15. See Rb^{85}, Senitzky et al.

J.W.Trischka, R.Braunstein, Phys. Rev. 96, 968 (1954).

Sr 38

Resonance $Sr(n,\gamma)$ E_n = 0.025 to 500 ev
3.58 ev $\sigma_0\Gamma^2$ = 5.6 to 8.4 mod cyc

E.Meservey, Phys. Rev. 96, 1006 (1954); 86, 605A (1952).

Sr^{87} 38 49 2.8^h

γ (0.388) α = 0.28 ic
Authors conclude γ is E5 d 80^hY

I.A.Antonova, I.V.Estulin, Izvest. Akad. Nauk Ser. Fiz. SSSR 18, 79 (1954).

Sr^{88} 38 50 stable

Resonance Sr^{87}(n)

E_o(ev)	Γ_n(10^{-3}ev)	chopper Γ_γ(10^{-3}ev)
3.56	0.80	205

A.Stolovy, J.A.Harvey, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), B9(1955); priv. comm.

$Sr^{89?}$ 38 51

τ_1 ~10^d Sr^{88}(slow n,γ) chem

γ a

Analysis of decay curve suggests 10^d p of 50^dSr

G.Herrmann, Z.Elektrochem. 58, 626 (1954).
G.Herrmann, F.Strassmann, Z.Naturf. 10a,146 (1955).

Sr^{89} 38 51 50^d

τ 50.4^d *2* Sr^{88}(slow n,γ) chem

G.Herrmann, Z. Elektrochem. 58, 626 (1954).
G.Herrmann, F.Strassmann, Z.Naturf. 10a,146 (1955).

Levels $Sr^{(88)}$(d,p) E_d = 15.1
g.s. Q = 4.29 *15* scin
1.09

M.S.Wall, Phys. Rev. 96, 664 (1954).

Sr^{91} 38 53 9.7^h

τ 9.7^h *1* U(pile n,f) chem

β^- 50% 0.8 a
25% 1.4
25% 2.7

p 50^mY chem; p 57^dY chem

G.Herrmann, Z.Elektrochem. 58, 626 (1954).
G.Herrmann, F.Strassmann, Z.Naturf. 10a, 146 (1955).

Y^{90} 39 51 64.2^h

τ 64.24^h *30* d 28^ySr chem; GM

M.L.Volchok, J.L.Kulp, Phys. Rev. 97, 102 (1955).

τ 64.2^h *2* d 28^ySr chem; GM

P.Schmeling, Z. Naturf. 10a, 79 (1955).

No nuclear γ ($< 10^{-4}$%) scin

B.Saraf, J.Varma, C.E.Mandeville, Phys. Rev. 98 (1955).
BAPS 30, #1(New York) SF1; priv. comm.

Zr 40

Levels Y^{89}(d,p) E_d = 15.1 scin
g.s. l_n = 2 Q = 4.41 *5*
1.17* l_n = 0 d,p(θ)
*Possibly two unresolved levels

N.S.Wall, Phys. Rev. 96, 664, 670 (1954).

γ Zr(n,?γ) E_n = 3.2 scin

0.038†	0.69	0.14†	1.5
0.40†	0.89	0.44†	2.2
0.12†	1.14		

†σ in barns

V.E.Scherrer, S.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

Levels Zr(n,n') E_n = 4.4
~0.008† 2.2 ppl
~0.008† 2.8 ?
No 0.93 level
†$d\sigma/d\omega$(90°)

J.B.Weddell, B.Jennings, R.L.Heilens, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), F6 (1955).

Zr^{90} 40 50 0.83*

τ_1 0.83^s *3* Zr^{90}(fast n,n')
γ 2.30 *2* E5 scin
Graph of σ from threshold (2.3) to 4.4 shows higher levels feed this metastable state
Comparison with Hauser-Feshbach theory gives best fit for L = 5-*
Not d 15^{h}Nb*

E.C.Campbell, R.W.Fuelle, F.C.Malenschein, P.M.Stelson, Phys. Rev. 98 (1955).
BAPS,30, #1(New York), MA3; *verbal report.

Zr^{91} 40 51 stable

Resonances Zr^{90}(n) E_n = 5 to 140 kev

E_o(kev)	Γ(kev)	Li(p,n)
18	0.12	
42	0.40	

P.F.Nichols, R.G.Smith, H.W.Newson, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), F2(1955);

Zr^{92} 40 52 stable

Resonance Zr^{91}(n) chopper

E_o(ev)
296

A.Stolovy, J.A.Harvey, Phys. Rev. 99(1955); BAPS 30, #3(Washington), B9(1955); priv. comm.

Zr^{93} 40 53 9.5×10^5y

Resonances Zr^{92}(n) E_n = 5 to 140 kev

E_o(kev)	Γ(kev)	Li(p,n)
7	0.05	
48	0.35	

P.F.Nichols, R.G.Smith, H.W.Newson, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), F2(1955).

Zr^{95} 40 55 65^d

Levels Zr^{94}(d,p) E_d = 15.1
g.s. Q = 4.19 *5* scin
0.9 *2*

N.S.Wall, Phys. Rev. 96, 664 (1954).

Resonances Zr^{94}(n) E_n = 5 to 140 kev

E_o(kev)	Γ(kev)	Li(p,n)
20	0.11	
44	0.20	
68	0.50	

P.F.Nichols, R.G.Smith, H.W.Newson, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), F2(1955).

Zr^{97} 40 57 17.0^h

γ 2% 1.6 Zr^{96}(pile n,γ) scin

B.Saraf, J.Varma, C.E.Mandeville, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), SF1; priv. comm.

Nb 41

Abundances ms
Nb^{93} 100%
All others $< 2\times10^{-4}$%

F.A.White, T.L.Collins, M.M.Rourke, Phys. Rev. 98 (1955).
BAPS 30, #1(New York), MA.

Nb^{89} 41 48 ~2^h

τ_1 ~2^h $Zr^{(90)}$(40-Mev p,2n)
p 4.3^{m}Zr chem Y^{89}(60-Mev α,4n) chem

M.B.Mathur, E.K.Hyde, C.A.Levine, P.K.Kofstad, Phys. Rev. 97, 117 (1955).

Nb^{89} 41 48 1.9^h

τ_2 1.9^h $Zr^{(90)}$(40-Mev p,2n)
Y^{89}(60-Mev α,4n) chem
β^+ 2.85 *10* scin
No γ scin
p 79^{h}Zr chem

M.B.Mathur, E.K.Hyde, C.A.Levine, P.K.Kofstad Phys. Rev. 97, 117 (1955).

Nb^{90} 41 49 14.6^h

τ		14.60^h 6	Zr(26-Mev d)	chem	
β^+	4.6†	0.55		scin,sd	
	8.6†	0.865			
	87†	1.500 5			
			K/L	α_K	
γ	vw†	0.133	3.6±0.4	large	E3,M2
	135†	0.142	5.8±0.6	0.32	E2
	3.6†	0.372	6.5±1.0	0.008	E2
	130†	1.130		0.00025	E2
	40†	1.27		<0.0005	
	20†?	1.767			
	120†	2.201		0.00006	E1

(1.5β)(ce$_K$ 0.142γ) $\gamma^{\pm}$(0.142γ, 1.13γ)
No(1.5β)(ce$_K$ 0.133γ) †Relative to 100 β^+

Ong Ping Hok, P.Kramer, G.Meijer, Physica 20, 1200(1954).

Nb^{91} 41 50 62^d

γ	0.1043	K/L = 2.0 ±0.1	sd ce

Ong Ping Hok, P.Kramer, G.Meijer, Physica 20, 1200 (1954).

Nb^{93} 41 52 stab le

γ	Nb^{93}(n,?γ)		E_n = 3.2	scin
	0.27		0.69	
	0.53		0.91	

V.E.Scherrer, B.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

Nb^{95} 41 54 90^h

γ	0.236	K/L = 3.7 ±0.1 sd ce

Ong Ping Hok, P.Kramer, G.Meijer, Physica 20, 1200(1954).

Nb^{97} 41 56 74^m

γ	0.75	d 17^{h}Zr	scin

B.Saraf, J.Varma, C.E.Mandeville, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), SP1, priv. comm.

Nb^{97} 41 56 74^m

γ	0.67	d 60^{s}Nb	scin

B.Saraf, J.Varma, C.E.Mandeville, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), SP1; priv. comm.

Mo 42

γ		Mo(n,?γ)	E_n = 3.2	scin
	0.66†	0.73		
	0.33†	1.4		
	0.06†	2.5		

†σ in barns

V.E.Scherrer, B.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

Mo^{91} 42 49 66^s

τ_1		66^s 3	$Mo^{(92)}$ (< 14-Mev γ,n)	
β^+	~30%			scin
γ	~70%	0.650 *15*	M4	
	w	1.22 *3*		
	w	1.55 *3*		

Threshold (66^s) - threshold(15.5^m) = -30 ± 60 kev

P.Axel, J.D.Fox, R.H.Parker, Phys. Rev. 97, 975 (1955).

Mo^{91} 42 49 15.5^m

τ_2	15.7^m 3	$Mo^{(92)}$ (≤ 14-Mev γ,n)	
β^+			scin

No γ

P.Axel, J.D.Fox, R.H.Parker, Phys. Rev. 97, 975 (1955).

Mo^{93} 42 51 > 2^y

Levels	Mo^{92}(d,p)	E_d = 15.1	
	g.s.	Q = 5.63 *5*	scin
	0.91 *10*		
	1.41 *10*		
	2.23 *10*		
	2.73 *10*		

N.S.Wall, Phys. Rev. 96, 664 (1954).

Mo^{94} 42 52 stable

Level	Mo^{94}(α,α'γ)		E_α = 6.5	scin
γ	0.87 *13*	τ_γ(E2) = 0.9x10^{-12}s		

N.P.Heydenburg, G.M.Temmer, Phys. Revw 99(1955) (1955); BAPS 30, #3 (Washington), CA10(1955); verbal report.

Mo^{95} 42 53 stable

Level	$Mo^{(95)}$(p,p'γ)		E_p = 2.46	
γ	0.199	ϵB(E2) = 0.057*		scin

G.Paulissen, H.Mark, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), CA6 (1955); *verbal report.

Level	Mo^{95}(α,α'γ)		E_α = 6.0	scin
γ	0.204 *4*	τ_γ(E2) = 3.2 x 10^{-9}s		

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 99(19 (1955); BAPS 30, #3 (Washington), CA10 (1955); verbal report.

Mo^{96} 42 54 stable

Level	Mo^{96}(α,α'γ)		E_α = 6.5;	scin
γ	0.778 *11*	τ_γ(E2) = 1.7 x 10^{-12}s		

N.P.Heydenburg, G.M.Temmer, Phys. Revs 99 (1955); BAPS 30, #3 (Washington), CA10(1955); verbal report.

Mo^{98} 42 56 stable

Levels	Mo^{97}(d,p)	E_d = 15.1	
	g.s.	Q = 6.06 *10*	scin
	2.5 *3*		

N.S.Wall, Phys. Rev. 96, 664 (1954).

Mo^{98} 42 56 stable

Level — $Mo^{98}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.5$; scin
γ — 0.786 *11* $\tau_\gamma(E2) = 1.8 \times 10^{-12}$s*

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 99 (1955); BAPS 30, #3(Washington), CA10(1955); *verbal report.

Mo^{99} 42 57 66h

β^-		0.41		sl	$\beta\gamma$, sl
		0.80			
		1.18			
γ	35*	(0.040)	$\alpha\sim30$	E2	$\gamma\gamma/\gamma$
	65*	(0.18)	$\alpha\sim0.6$	M1	
		0.39 *2*			$\beta\gamma$

(0.41 β)(0.74 + 0.78 γ) ($E_\beta \simeq 0.58$)(0.39 γ)
(0.80 β)(0.39 γ)/β = 0.03
*Relative numbers of photons plus ce

C.Levi, L.Papineau, Compt. rend. 239, 1782 (1954).

(0.740 γ)(0.181 γ)(#) — J = 1/2, 5/2, 9/2 scin
Mo^{98}(pile n,γ)

U.Cappeller, R.Klingelhöfer, Z. Phys. 139, 402 (1954).

Mo^{100} 42 58 stable

Level — $Mo^{100}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.0$; scin
γ — 0.528 *8* $\tau_\gamma(E2) = 8.4 \times 10^{-12}$s*

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 99 (1955); BAPS 30, #3 (Washington), CA10(1955); *verbal report.

Tc^{98} 43 55

Indications for natural Tc^{98} from:
1. 6h period produced by Re ores (pile n)
2. Abnormal abundance of Ru^{98} in Mo ores

W.Herr, Z. Naturf. 9a, 907 (1954).

Ru^{100} 44 56 stable

Level — $Ru^{(100)}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.0$ scin
γ — 0.540 *8* $\tau_\gamma(E2) = 1.6 \times 10^{-11}$s*

G.M.Temmer, N.P.Heydenburg, Phys. Rev. 99 (1955); BAPS 30, #3(Washington), CA9(1955); *verbal report.

Ru^{102} 44 58 stable

Level — $Ru^{(102)}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.0$ scin
γ — 0.473 *7* $\tau_\gamma(E2) = 1.6 \times 10^{-11}$s*

G.M.Temmer, N.P.Heydenburg, Phys. Rev. 99 (1955); BAPS 30, #3 (Washington), CA9(1955); *verbal report.

Ru^{103} 44 59 40d

$Ru^{(102)}$(pile n,γ) chem

β^-	7%*	0.11 *1*	0.1%*	(0.670)	scin
	(90%)	(0.220)	3%*	(0.715)	$\beta\gamma$
γ	6†	0.055 *3*	$\alpha_K = 1.2 \pm 0.3$	M1	scin
	6†	0.440 *10*	6†	0.555 *10*	$\gamma\gamma$
	1000†	0.495 *5*	70†	0.610 *5*	

(0.220 β)(0.495 γ) (0.110 β)(0.610 γ) scin
No (hard β)(0.055 γ) (0.055 γ)(0.44 γ, 0.55 γ)
No 0.300 γ, 0.385 γ (< 1†)
Decay scheme proposed
*Calculated from corresponding γ intensities

B.Saraf, Phys. Rev.97, 715 (1955); J. Franklin Inst. 258, 517A (1954).

Ru^{103} 44 59 40d

Ru(28-Mev d) chem

β^-	7%	0.14 *4*		a$\beta\gamma$
	89%	(0.217)		
	~0.3%*	(0.398)		
	~0.4%*	(0.460)		
	3.0%**	(0.702)		
γ	4†	0.058 *5*		scin
	~4†	(0.295)		
	~3†	(0.357)		
	1000†	0.498	K/LM = 8 ±2	scin, sl ce
	78†	(0.611)	$\alpha_K = 6 \pm 2 \times 10^{-4}$**	E1
	91†	Rh K x ray		

(0.14 β)(0.611 γ) No (0.70 β)(0.058 γ) scin
*Calculated from corresponding γ intensities
**Based on α_K (0.498 γ) = 0.01
Decay scheme proposed

B.De Raad, W.C.Middelkoop, B. Van Nooyen, P.W.Endt, Physica 20, 1278 (1954).

Ru^{104} 44 60 stable

Level — $Ru^{(104)}(\alpha,\alpha'\gamma)$ $E_\alpha = 6.0$ scin
γ — 0.355 *6* $\tau_\gamma(E2) = 6 \times 10^{-11}$s*

G.M.Temmer, N.P.Heydenburg, Phys. Rev. 99 (1955); BAPS 30, #3(Washington), CA9(1955); *verbal report.

Ru^{107} 44 63 4m

β^- ~4 — $Pd^{(110)}$(fast n,α) chem
High energy γ's — U(28-Mev d,f), U(n,f) chem
p 24^mRh

G.B.Baró, P.Rey, W.Seelmann-Eggebert, Z.Naturf. 10a, 81 (1955).

Ru^{108}? 44 64

τ ~4m — U(28-Mev d,f) chem
p 18^sRh chem — Mass assignment uncertain

G.B.Baró, P.Rey, W.Seelmann-Eggebert, Z.Naturf. 10a, 81 (1955).

Rh^{96} 45 51 ~11m

τ ~11m — Ru^{96}(10-Mev p,n) chem

D.J.Farmer, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), V7(1955); verbal report.

Rh^{99}? 45 54

Ru^{99}(10-Mev p,n) chem

τ_1	15.0d *2*		
γ	0.089		sl ce
	0.353		

(0.089 γ)(0.353 γ) γ^2(0.089 γ, 0.353 γ)

D.J.Farmer, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), V7(1955); verbal report.

Rh^{101} 45 56

τ_1		4.3d	Ru^{101}(10-Mev p,n)	chem
γ	3*	0.158	α large	M4 sl ce
			K : L : M = 17 : 6 : 1	
τ_2		4.3h		
γ	1*	0.307	K/LM~7	sl ce,pe

*Relative intensity ce

D.J.Farmer, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), V7(1955); verbal report.

$Rh^{102}_{45\ 57}$

τ_1	5^y *1*		Ru(10-Mev p,n)	chem
γ	0.127	K/L~8		sl ce
	0.198			

(0.127 γ)(0.198 γ) No $\gamma^{\pm}$(0.127 γ, 0.198 γ)

*Both γ's converted in Rh

D.J.Farmer, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), V7(1955); *verbal report.

$Rh^{102}_{45\ 57}$ 210^d

			Ru^{102}(10-Mev p,n)	chem
γ	0.474		0.766	sl pe
	0.626		1.040	
	0.695		1.105	

No 0.086 γ, 0.127 γ, 0.198 γ, 0.353 γ

(0.474 γ)(0.626 γ) $\gamma^{\pm}$(0.474 γ, 0.626 γ)

D.J.Farmer, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), V7(1955); verbal report.

$Rh^{104}_{45\ 59}$ 4.3^m

β^-	0.026%*	(0.30)		Rh^{103}(pile n,γ)	
	0.12%*	(0.48)			
γ	~100%*	0.051	IT		scin
	100+	0.556	1.4+	0.93	
	4.7+	0.745	0.6+	1.34	
	5.7+	0.78	1.9+	1.53	

No other γ with $0.05 < E_\gamma < 0.55$

(0.556 γ)(0.745 + 0.78 γ, 0.93 γ, 1.53 γ)

(0.745 + 0.78 γ)(0.78 + 0.745 γ, 0.93 γ, 1.34 γ)

(1.34 γ)(0.745 γ, 0.93 γ)

*Calculated from γ intensities

+γ intensities in equilibrium mixture

W.E.Bunker, J.P.Mize, J.W.Starner, Phys. Rev. 99(1955); BAPS 30,#3(Washington), V6(1955); verbal report.

$Rh^{104}_{45\ 59}$ 44^s

β^-	0.11%	0.64	Rh^{103}(pile n,γ);	sl $\beta\gamma$
	1.85%	1.88		sl $\beta\gamma$
	98%	2.44		scin,sl
γ	100+	0.556		scin
	5.8+	1.24		

No other γ with $0.05 < E_\gamma < 0.55$

(0.556 γ)(1.24 γ) No 1.80 γ (<0.3+)

W.E.Bunker, J.P.Mize, J.W.Starner, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), V6(1955); verbal report.

$Rh^{106?}_{45\ 61}$

τ	117^m		Pd(30-Mev d)	chem
			Pd(fast n)	chem
β^-	~100%	0.7		a
	w	0.95 ?		

No β^+

Complex γ spectrum E_γ/β~4 Mev a, scin

Not d 1.0^{y}Ru; not d short-lived Ru

Not produced by U, Th(30-Mev d, f)

G.B.Baró, W.Seelmann-Eggebert, I.E.Zabala, Z. Naturf. 10a, 80 (1955).

$Rh^{106}_{45\ 61}$ 30^s

No delayed $\beta\gamma$ ($\tau_\gamma < 5\times10^{-10}$s)

V.Z.Wintersteiger, Bull. Inst. Nuclear Sci., Boris Kidrich 4, 79 (1954).

$Rh^{106}_{45\ 61}$ 30^s

(0.513 γ)(0.624 γ)		d 1.0^{y}Ru	Σscin

D.C.Lu, W.H.Kelly, M.L.Wiedenbeck, Phys. Rev. 97, 139 (1955).

$Rh^{107}_{45\ 62}$ 24^m

τ_1	25^m		U,Ta^{181}(340-Mev p)	chem
γ	0.095 *5*		d Ru	
	0.145 *5*			scin
	0.305 *5*			
	0.390 *10*			
	0.475 *10*			d Ru

W.E.Nervik, G.T.Seaborg, Phys. Rev. 97, 1092 (1955).

τ_1	23^m		d 4^mRu	chem
β^-	~100%	1.15		a
w	~2			
γ	0.315			scin
	0.400			
	0.580			
	0.680			

Other weak γ's

G.B.Baró, P.Rey, W.Seelman-Eggebert, Z.Naturf. 10a, 81 (1955).

$Rh^{107?}_{45\ 62}$

			U,Ta^{181}(340-Mev p)	chem
τ_2	2.3^h		Not d $\geq 1^m$Ru	
β^-	~1			a
γ	0.195	1.06		scin
	0.225	1.20		
	0.510	1.26		
	0.630	1.50		
	0.715			

Mass assignment uncertain, possibly Rh^{106}

W.E.Nervik, G.T.Seaborg, Phys. Rev. 97, 1092 (1955).

$Rh^{108?}_{45\ 63}$

τ	18^s *1*		d ~4^mRu	chem
β^-	4-5			a
Complex γ spectrum				a, scin

Mass assignment uncertain, but not p 13^hPd

G.B.Baró, P.Rey, W.Seelman-Eggebert, Z.Naturf. 10a, 81 (1955).

$Pd^{103}_{46\ 57}$ 17^d

			Pd^{102}(pile n,γ)	chem
γ	~100†	0.040		scin
	4†	0.065 *3*		
		~0.260?		
	12†	0.300 *5*		
	~66†	0.365 *5*		
	10†	0.495 *5*		

(0.065 γ)(0.300 γ) No other $\gamma\gamma$ scin

Decay scheme proposed

†Photons per 10^5 disintegrations

B.Saraf, Phys. Rev. 97, 715 (1955); J.Franklin Inst. 258, 517A (1954).

Pd^{104} 46 58 stable

Level	$Pd^{104}(\alpha,\alpha'\gamma)$	$E_\alpha = 6.0$	scin
γ	0.550 *8*	$\tau_\gamma(E2) = 0.9\times10^{-11}$s*	

G.M.Temmer, N.P.Heydenburg, Phys. Rev. 99 (1955); BAPS 30, #3 (Washington), CA9(1955); *verbal report.

Pd^{105} 46 59 stable

	$Pd^{105}(\alpha,\alpha'\gamma)$	$E_\alpha = 6.0$	scin
γ	0.266 *5*		
	0.433 *?*		

G.M.Temmer, N.P.Heydenburg, Phys. Rev. 99 (1955); BAPS 30, #3(Washington), CA9(1955).

	$Pd^{105}(p,p'\gamma)$	$E_p = 2.6$	
γ	0.270	$\epsilon B(E2) = 0.0084$*	scin
	0.430	$= 0.057$*	

G.Paulissen, H.Mark, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), CA6(1955); *verbal report.

Pd^{106} 46 60 stable

Level	$Pd^{106}(\alpha,\alpha'\gamma)$	$E_\alpha = 6.0$	scin
γ	0.510 *8*	$\tau_\gamma(E2) = 1.1\times10^{-11}$s*	

G.M.Temmer, N.P.Heydenburg, Phys. Rev. 99 (1955); BAPS 30, #3(Washington), CA9(1955); *verbal report.

Level	$Pd^{106}(p,p'\gamma)$	$E_p = 2.75$	
γ	0.500	$\epsilon B(E2) = 0.18$*	scin

G.Paulissen, H.Mark, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), CA6(1955); *verbal report.

Pd^{108} 46 62 stable

Level	$Pd^{108}(\alpha,\alpha'\gamma)$	$E_\alpha = 6.0$	scin
γ	0.420 *6*	$\tau_\gamma(E2) = 2.7\times10^{-11}$s	

G.M.Temmer, N.P.Heydenburg, Phys. Rev. 99 (1955); BAPS 30, #3 (Washington), CA9(1955); verbal report.

Level	$Pd^{108}(p,p'\gamma)$	$E_p = 2.75$	
γ	0.425	$\epsilon B(E2) = 0.21$*	scin

G.Paulissen, H.Mark, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), CA6(1955); *verbal report.

Pd^{110} 46 64 stable

Level	$Pd^{110}(\alpha,\alpha'\gamma)$	$E_\alpha = 6.0$	scin
γ	0.370 *5*	$\tau_\gamma(E2) = 4.4\times10^{-11}$s*	

G.M.Temmer, N.P.Heydenburg, Phys. Rev. 99 (1955); BAPS 30, #3 (Washington); CA9(1955); verbal report.

Level	$Pd^{110}(p,p'\gamma)$	$E_p = 2.75$	
γ	0.365	$\epsilon B(E2) = 0.26$*	scin

G.Paulissen, H.Mark, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), CA6(1955); *verbal report.

Ag 47 γ $Ag(n,?\gamma)$ $E_n = 3.2$ scin

0.74
1.10
1.50

V.E.Scherrer, S.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

Ag 47 stable

Levels	$Ag(p,p'\gamma)$	$E_p = 3.0$		
γ	0.320	~90%	M1	sm ce
	0.420	E2*	*From K/L	

E.M.Bernstein, H.W.Lewis, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), CA7(1955); verbal report.

Ag^{107} 47 60 stable

Levels	$Ag^{107}(p,p'\gamma)$	$E_p = 5$	
	$Ag^{107}(\alpha,\alpha'\gamma)$	$E_\alpha = 5$	
γ	0.319		scin
	0.419		

L.W.Fagg, E.A.Wolicki, R.O.Bondelid, K.L.Dunning, S.Snyder, Phys. Rev. 98 (1955). BAPS 30, #2 (Baltimore), G10.

Ag^{108} 47 61 2.3m

Resonances	$Ag^{(107)}(n)$	$E_n = 10$ to 75 ev	
	E_o (ev)		mod cyc
	(16.6)	$\sigma_o = 2.6\times10^3$	
	41.8		
	45.3		
	51.7		

See Ag^{110} for other Ag resonances

G.Grimm, L.J.Rainwater, W.W.Havens, jr., Phys. Rev. 98 (1955). BAPS 30, #1 (New York), HA2; verbal report.

Ag^{109} 47 62 stable

Levels	$Ag^{109}(p,p'\gamma)$	$E_p = 5$	
	$Ag^{109}(\alpha,\alpha'\gamma)$	$E_\alpha = 5$	
γ	0.306		scin
	0.412		

L.W.Fagg, E.A.Wolicki, R.O.Bondelid, K.L.Dunning, S.Snyder, Phys. Rev. 98 (1955). BAPS 30, #2 (Baltimore), G10.

Ag^{110} 47 63 270d

IT	5%		4π pc, cryst
x	2.5%	Ag K x ray	
	1.2%	Cd K x ray	
No ϵ_K	(<0.5%)	(Pd K x ray <0.6%)	

H.Jaffe, UCRL-2537 (1954).

Ag^{110} 47 63 24s

No ϵ_K (<10%) (See 270^dAg) cryst

H.Jaffe, UCRL-2537 (1954).

Resonance $Ag^{(109)}(n,\gamma)$ mod cyc
(5.13 ev) $\sigma_o\Gamma^2 = 345 \pm 30$
Assuming $\Gamma_n/\Gamma = 0.11$

E.Wasserveg, Phys. Rev. 96, 1006 (1954); 86, 603A (1952).

$Ag^{110}_{47\ 63}$ 24^s

Resonances $Ag^{(109)}(n)$ E_n = 10 to 75 ev mod cyc

E_o (ev)
30.6
40.6
56.1
71.4

See Ag^{108} for other Ag resonances

G.Grimm, L.J.Rainwater, W.W.Havens, Jr., Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), HA2; verbal report.

Cd 48

γ $Cd(n,?\gamma)$ E_n = 3.2 scin

0.69+	0.57
0.020+	2.8

+σ in barns

V.E.Scherrer, B.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

Resonances $Cd(n,\gamma)$ E_n = 0.025 to 500 ev mod cyc

E_o (ev)	
0.177 *5*	Γ = 0.110 *5* ev
	σ_o = 7.6×10^3 *3*
~18	$\sigma_o\Gamma$ ~3
28	$\sigma_o\Gamma^2$ = 9
100	

Other unresolved resonances with E_o > 100

E.Meservey, Phys. Rev. 96, 1006 (1954); 86, 609A (1952).

$Cd^{110}_{48\ 62}$ stable

Level $Cd^{110}(\alpha,\alpha'\gamma)$ E_α = 6.0 scin
γ 0.654 *9* $\tau_\gamma(E2) = 3.6\times10^{-12s}$*

G.M.Temmer, N.P.Heydenburg, Phys. Rev. 99 (1955); BAPS 30, #3 (Washington), CA9(1955); *verbal report.

$Cd^{111}_{48\ 63}$ stable

0.247 level d 2.8^d In

μ −0.783 ± *0.028* $\gamma\gamma(\theta,H)$

Measurement independent of quadrupole interaction

R.W.Steffan, W.Zobel, Phys. Rev. 97, 1188 (1955).

0.247 level Single In crystal

μ −0.725 *47* $\gamma\gamma(\theta,H)$
|q| ~1

H.Albers-Schönberg, E.Heer, T.B.Novey, P.Scherrer, Helv. Phys. Acta 27, 547, 637 (1954).

Level $Cd^{111}(\alpha,\alpha'\gamma)$ E_α = 6.0 scin
γ 0.340 *6* $\tau_\gamma(E2) = 1.8\times10^{-10s}$*

G.M.Temmer, N.P.Heydenburg, Phys. Rev. 99 (1955); BAPS 30, #3 (Washington), CA9(1955); *verbal report.

Level $Cd^{111}(p,p'\gamma)$ E_p = 2.75
γ 0.330 $\epsilon B(E2)$ = 0.027 scin

G.Paulissen, H.Mark, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), CA6(1955); verbal report.

$Cd^{112}_{48\ 64}$ stable

Level $Cd^{112}(\alpha,\alpha'\gamma)$ E_α = 6.0 scin
γ 0.620 *9* $\tau_\gamma(E2) = 4.5\times10^{-12s}$*

G.M.Temmer, N.P.Heydenburg, Phys. Rev. 99 (1955); BAPS 30, #3 (Washington), CA9(1955); *verbal report.

Level $Cd^{112}(p,p'\gamma)$ E_p = 2.75
γ 0.610 $\epsilon B(E2)$ = 0.13 scin

G.Paulissen, H.Mark, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), CA6(1955); verbal report.

$Cd^{113}_{48\ 65}$ stable?

Levels $Cd^{113}(\alpha,\alpha'\gamma)$ E_α = 6.0 scin
γ 0.290 *5* $\tau_\gamma(E2) = 1.1\times10^{-9s}$
0.550?

G.M.Temmer, N.P.Heydenburg, Phys. Rev. 99 (1954); BAPS 30, #3 (Washington), CA9(1955) *verbal report.

Level $Cd^{113}(p,p'\gamma)$ E_p = 2.75
γ 0.290 $\epsilon B(E2)$ = 0.058* scin

G.Paulissen, H.Mark, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), CA6(1955); *verbal report.

Levels $Cd^{112}(d,p)$ E_d = 15.1
g.s. Q = 4.10 *9* scin
0.55 *8*

N.S.Wall, Phys. Rev. 96, 664 (1954).

$Cd^{114}_{48\ 66}$ stable

Level $Cd^{114}(\alpha,\alpha'\gamma)$ E_α = 6.0 scin
γ 0.550 *8* $\tau_\gamma(E2) = 0.8\times10^{-11s}$*

G.M.Temmer, N.P.Heydenburg, Phys. Rev. 99 (1955); BAPS 30, #3 (Washington), CA9(1955); *verbal report.

Level $Cd^{114}(p,p'\gamma)$ E_p = 2.75
γ 0.545 $\epsilon B(E2)$ = 0.14* scin

G.Paulissen, H.Mark, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), CA6(1955)*verbal report.

Capture γ's $Cd^{(113)}(n,\gamma)$ (x)pe sl

89+	0.557 *3*	10+	1.308 *8*	
20+	0.651 *4*	13+	1.388 *8*	
7+	0.728 *5*	5+	1.500 *15*	
7+	0.803 *5*	6+	1.655 *10*	
10+	1.215 *8*			

H.Motz, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), TA12(1955).

$Cd^{115}_{48\ 67}$ 43^d

γ	10†	0.485		scin
	74†	0.935		
	31†	1.30		

No 0.12 γ, 0.450 γ, 0.500 γ scin, $\gamma\gamma$
(0.485 γ)(0.935 γ)(θ) ~isotropic
No (1.30 γ) γ

J.Varma, C.E.Mandeville, Phys. Rev. 97, 977 (1955); Phys. Rev. 95, 613A (1954).

$Cd^{115}_{48\ 67}$ 2.25^d

Cd^{114}(pile n,γ) chem

β^-	37%	(0.59) (0.63)	63%	(0.86) (1.11)	sl
γ	10†	0.230	220†	0.490	scin
	30†	0.260	430†	0.523	
	3†	0.263			No 0.856 γ

(0.860 β)(0.260 γ) (0.260 γ)(0.230 γ, 0.263 γ?)
No (E_β > 0.62)(0.490 γ, 0.523 γ)
x(0.490 γ)/0.490 γ = 0.03

J.Varma, C.E.Mandeville, Phys. Rev. 97, 977 (1955).

$Cd^{116}_{48\ 68}$ stable

Level $Cd^{116}(\alpha,\alpha'\gamma)$ E_α = 6.0 scin
γ 0.508 δ τ_γ(E2) = 1.1 x 10^{-11}s*

G.M.Temmer, N.P.Heydenburg, Phys. Rev. 99 (1955); BAPS 30, #3 (Washington), CA9(1955); *verbal report.

$In^{111}_{49\ 62}$ 2.8^d

(0.172 γ)(0.247 γ)(θ) $\eta(\pi)$ = -0.181 *5*
Influence of viscosity of solvent studied

R.M.Steffen, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), V8 (1955).

$In^{113}_{49\ 64}$ 1.73^h

γ	(0.392)	α = 0.44	ic
Authors conclude γ is E5			d 118^{d}Sn

I.A.Antonova, I.V.Estulin, Izvest. Akad. Nauk Ser. Fiz. SSSR 18, 79 (1954).

$In^{113}_{49\ 64}$ stable

τ(L x ray) >10^{14}y pc
τ(K x ray) >10^{16}y

J.Heintze, Z. Naturf. 10a, 77 (1955).

$In^{115}_{49\ 66}$ 4.5^h

γ	(0.335)	α = 0.82	ic
Authors conclude γ is E5			d 2.3^{d}Cd

I.A.Antonova, I.V.Estulin, Izvest. Akad. Nauk Ser. Fiz. SSSR 18, 79 (1954).

d 2.25^{d}Cd chem

γ	0.335	α_K = 0.83 M4	sl, scin
		K/LM = 3.85 L/M > 10	

J.Varma, C.E.Mandeville, Phys. Rev. 97, 977, (1955).

$In^{115}_{49\ 66}$ 6x10^{14}y

$In^{(115)}$(n,?γ) E_n = 3.2 scin

0.160†	0.77	0.100†	1.15
0.270†	0.88	0.160†	2.1

†σ in barns

V.E.Scherrer, B.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

$In^{116}_{49\ 67}$ 13^s

Resonances $In^{(115)}$(n) E_n = 0.3 to 12 ev

E_o (ev)	σ_o
1.458	39 100
3.86	
9.04	

J.Moore, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), B3(1955); verbal report.

$In^{117}_{49\ 68}$ 1.9^h

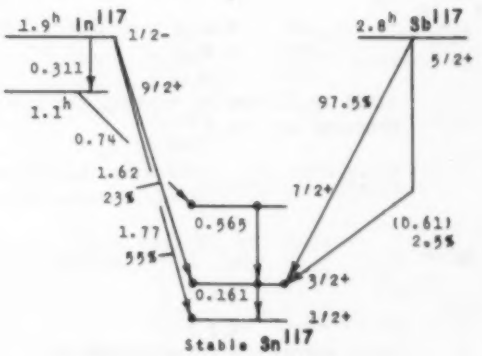
τ_1		1.90^h *5*	d 50^{m}Cd	chem
β^-	23%	1.616 *5*		sl
	55%	1.772 *5*		
γ		0.161 *1*	α_K = 0.01	scin, sl ce
			K/LM = 8.3	
	22%	0.311 *2*	α_K = 1.3	M4

β(0.161 γ) No (0.311 γ)(β,γ)
p 1.1^{h}In 22% Not d 3.0^{h}Cd (<10%)

$In^{117}_{49\ 68}$ 1.1^h

τ_2	1.1^h *1*	d 3.0^{h}Cd	chem
β^-	0.74 *1*		sl
γ	0.161 *1*		scin, sl ce
	0.565 *9*	α~0.005	

No 0.726 γ (< 1% of 0.565 γ) scin
(0.565 γ)(β, 0.161 γ)
Not p 14^{d}Sm (<1%)



C.L.McGinnis, Phys. Rev. 97, 93 (1955); 94, 780A (1954).

Sn 50

γ $Sn(n,?\gamma)$ E_n = 3.2 scin

0.14†	0.69	
1.67†	1.14	
0.21†	2.0	

†σ in barns

V.E.Scherrer, B.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

$Sn^{125}_{50\ 75}$ 9.9^d

τ_1	9.7^d	Sn^{124}(pile n,γ)		chem
β^-	~0.4		a $\beta\gamma$	scin
	~1.3		a $\beta\gamma$	scin
	~2.4		a	
γ	0.34 *1*	1.07 *1*		scin
	0.47 *1*	1.41 *2*		
	0.81 *1*	1.97 *2*		
	0.90 *1*			

(1.07 γ)(0.34 γ, 0.47 γ, 0.81 γ, 0.90 γ) scin
(0.47 γ)(1.07 γ, 1.41 γ) (1.41 γ)(0.47 γ)
No ($E_\gamma > 1.5$) γ

$Sn^{125}_{50\ 75}$ 9.5^m

τ_2	9.4^m	Sn^{124}(pile n,γ)		chem
γ	0.326			scin
	0.64			
	1.07			
	1.39			

(0.326 γ)(1.39 γ) (1.07 γ)(0.64 γ) scin

S.B.Burson, J.M.LeBlanc, D.W.Martin, Phys. Rev. 99(1955); BAPS 30, #3(Washington), V10(1955); verbal report.

Levels Sn^{124}(d,p) E_d = 15.1

g.s	Q = 3.52 *7*	scin
1.16 *8*		
2.77 *10*		
3.41 *10*		
4.09 *10*		

N.S.Wall, Phys. Rev. 96, 664 (1954).

$Sn^{130?}_{50\ 80}$ 57^m

τ	57^m *2*	U(30-Mev d,f)	chem
p 10^{m}Sb chem		U(n,f)	chem

I.Fränz, J.Rodriquez, H.Carminatti, Z. Naturf. 10a, 82 (1955).

$Sb^{116}_{51\ 65}$ 60^m

τ_1	60^m	In(11^5)(26-Mev α,3n)		chem
γ	15†	0.41 *2*		scin
	130†	0.95 *5*		
	150†	1.31 *5*		

Yield 15.5^{m}Sb/60^{m}Sb ~const. for E_α = 26 to 52
†Photons per 100 β^+

A.H.W.Aten, Jr., J.Manassen, G.D.de Feyfer, Physica 20, 665 (1954).

$Sb^{116}_{51\ 65}$ 15.5^m

τ_2	14^m	In(11^5)(26-Mev α,3n)		chem
β^+	2.4 *2*			a
γ	2.2 *1*			scin

Lower-energy γ's probably present
Yield 15.5^{m}Sb/60^{m}Sb ~const. for E_α = 26 to 52

A.H.W.Aten, Jr., J.Manassen, G.D.de Feyfer, Physica 20, 665 (1954).

$Sb^{117}_{51\ 66}$ 2.8^h

		In(11^5)(22-Mev α,2n)	
γ	0.161	K/LM = 8.3 scin, sl ce	

No 0.585 γ (< 0.5%)
β^+/ϵ = 0.026 from $\gamma^\pm(0.161\gamma)/(0.161\gamma)$ = 0.05 indicating E_{β^+}(allowed) = 0.61
No ϵ to g.s. (< 5%) from $x\gamma/x$ = 0.68

C.L.McGinnis, Phys. Rev. 97, 93 (1955).

$Sb^{118}_{51\ 67}$ 5.1^h

β^+	0.7	6^{d}Te source	a $\beta\gamma$
(0.7 β) γ			
See 3.5^mSb^{118}			

R.W.Fink, Thesis, Univ. of Rochester, 1953.

$Sb^{118}_{51\ 67}$ 3.5^m

β^+	3.10 *5*	6^{d}Te source	s
γ	0.108		s ce
No (3.10 β) γ		p 5.1^{h}Sb?	

0.108 γ assumed IT to 5.1^{h}Sb

R.W.Fink, Thesis, Univ. of Rochester 1953.

$Sb^{120}_{51\ 69}$ 5.8^d

τ_1		5.8^d *22*	Sn^{119}(15-Mev d,n)		chem
γ	1770*	0.090 *1*	K/LM = 8.3	E1	sl ce
	1000*	0.200 *1*	K/LM = 4.6	E2	
	10.4*	1.035 *5*		E2	
	7.8*	1.180 *5*		E2	

(0.09 γ)(0.20 γ)(θ) ΔJ = 1(D),2(Q) scin
(0.20 γ)(1.04+1.18 γ)(θ) ΔJ = 2(Q),2(Q)
(1.04 γ)(1.18 γ)(θ) J = 4, 2, 0
(x) (0.09 γ, 0.20 γ, 1.04+1.18 γ) delay = 11$^{\mu s}$**
Not p 16.4^{m}Sb ($\beta^+ < 0.3\%$) scin
*Relative intensity ce

C.L.McGinnis, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), MA5; **verbal report.

$Sb^{120}_{51\ 69}$ 16.4^m

γ	1.18		scin
(1.18 γ)/β^+ = 0.03		Sb^{121} (≤50-Mev γ,n)	

C.L.McGinnis, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), MA5.

$Sb^{122}_{51\ 71}$ 2.75^d

β	12%	0.72 *2*	Sb^{121}(pile n,γ)	sl
	7%	0.90 *5*		
	60%	1.41 *1*	F-K plot linear	
	21%	1.97 *1*	ΔJ = 2, yes shape	
γ		0.558		sl pe
		0.687		

(1.41 β, ~0.90 β) γ sl
(0.90 β, 0.72 β) (1.1-1.2 γ)
(E_β = 0.3) (0.56 γ, 0.69 γ)
(E_β = 1.1) (0.56 γ), no (E_β = 1.1) (0.69 γ)

J.Moreau, Compt. rend. 239, 1130 (1954).

ϵ_K 2.6% (Sn K x ray 2.2%) 4π pc, cryst

M.Jaffe, UCRL-2537 (1954).

Resonances Sb^{121}(n)

E_o (ev)	Γ_n (10^{-3} ev)	chopper Γ_γ (10^{-3} ev)
6.23	2.4	69
15.3	5.0	125
29.7	2.4	126

A.Stolovy, J.A.Harvey, Phys. Rev. 99(1955); BAPS 30, #3(Washington), B9(1955); priv. comm.

$^{124}_{51}Sb_{73}$ 60^{d}

No ϵ_K (<0.1%) (K x ray ~0.4%) 4π pc

M.Jaffe, UCRL-2537 (1954).

Resonance	Sb^{123}(n)		chopper
	E_o(ev)	Γ_n(10^{-3}ev)	Γ_γ(10^{-3}ev)
	21.4	25	89

A.Stolovy, J.A.Harvey, Phys. Rev. 99(1955); BAPS 30, #3(Washington), 89(1955); priv comm.

$^{130?}_{51}Sb_{79}$ 10^{m}

τ	10.3^{m} 3	d 57^{m}Sn	chem
β^-	2.9		

I.Franz, J.Rodriquez, M.Carminatti, Z.Naturf. 10a, 82 (1955).

$^{Te}_{52}$

	$Te(n,?\gamma)$	E_n = 3.2	scin
γ	0.72	1.43	
	1.10	2.3	

V.E.Scherrer, B.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

$^{116?}_{52}Te_{64}$

τ	2-4^{h} ?	I^{127}(240-Mev p)	chem

p 10-20^{m}Sb chem

B.Dropesky, E.O.Wiig, (1953), unpublished.

$^{117}_{52}Te_{65}$ 2.5^{h}

τ	2.5^{h}	I^{127}(240-Mev p)	chem
β^+	2.5 *1*		s

p 2.8^{h}Sb chem

B.Dropesky, E.O.Wiig, (1952), unpublished.

		Cs^{133}(240-Mev p)	chem
β^+	2.5 *1*		s

R.W.Fink, E.O.Wiig, (1952), unpublished.

$^{118}_{52}Te_{66}$ 6^{d}

τ	6.0^{d}	I^{127}(240-Mev p)	chem

p 3.5^{m}Sb chem

B.Dropesky, E.O.Wiig, (1952), unpublished.

$^{119}_{52}Te_{67}$ 16^{h}

τ_2	16^{h} 2	I^{127}(240-Mev p)	chem
γ	0.56		s ce
No β^+	d 18^{m}I, p 39^{h}Sb		chem

B.Dropesky, Thesis, Univ. of Rochester (1953).

τ_2	16^{h} 2	Cs^{133}(240-Mev p)	chem

No strong β^+ Probably d 18^{m}I

R.W.Fink, Thesis, Univ. of Rochester (1953).

$^{123}_{52}Te_{71}$ stable

τ(L x ray)	>10^{13}y	pc
τ(K x ray)	>10^{15}y	

J.Heintze, Z. Naturf. 10a, 77 (1955).

	Te^{123}(p,p'γ)	E_p = 5	
	Te^{123}(α,α'γ)	E_α = 5	
γ	0.159	0.435	scin
	0.274	0.500	
	0.342		

(0.159γ)(0.274γ, 0.342γ) No(0.274γ)(0.342γ)

L.W.Fagg, E.A.Wolicki, R.O.Bondelid, K.L.Dunning, S.Snyder, Phys. Rev. 98 (1955). BAPS 30, #2 (Baltimore), 610; verbal report.

$^{125}_{52}Te_{73}$ stable

	Te^{125}(p,p'γ)	E_p = 5	
	Te^{125}(α,α'γ)	E_α = 5	
γ	0.439		scin

L.W.Fagg, E.A.Wolicki, R.O.Bondelid, K.L.Dunning, S.Snyder, Phys. Rev. 98 (1955). BAPS 30, #2(Baltimore), 610; verbal report.

$^{131}_{52}Te_{79}$ 1.2^{d}

β^-	52%	0.42	Te^{130}(11-Mev d,p)	chem
	17%	0.57		sl
	4.6%	0.98		
	4.7%	2.46		
γ	~22%	0.180 *2*	IT K/LM = 2.4	M4 sl ce
		0.051 *2?*	st 0.446 *4*	sl pe
		0.099 *1*	0.575 *12*	
	st	0.147 *1*	st 0.773 *8*	
		0.239 *9*	0.842 *13*	
		0.275 *9*	1.12 *1*	
	st	0.331 *5*	w 1.63 *2* ?	

(0.773γ)(1.12γ, 0.842γ?) No(0.331γ)(0.773γ)

Decay scheme proposed

E.Hobb, Phys. Rev. 97, 987 (1955).

$^{131}_{52}Te_{79}$ 25^{m}

β^-	15%	1.35	Te^{130}(slow n,γ)
	25%	1.69	1.2^{d} Te source; sl
	60%	2.14	
γ	(0.147)		scin
	(0.446)		
	(0.773)		

Decay scheme proposed

E.Hobb, Phys. Rev. 97, 987 (1955).

$^{119}_{53}I_{66}$ 18^{m}

τ	17^{m} 2	I^{127}(240-Mev p)	chem

p 16^{h}Te chem

B.Dropesky, Thesis, Univ. of Rochester (1953).

$^{120}_{53}I_{67}$

τ	≥1.1^{h}	I^{127}(240-Mev p)	chem
β^+	4.0 2		s

B.Dropesky, Thesis, Univ. of Rochester (1953).

τ	>1.3^{h}	Cs^{133}(100-Mev p)	chem
β^+	4.0 2		s

R.W.Fink, Thesis, Univ. of Rochester (1953).

$I^{121}_{53\ 68}$ 1.5^h

τ		1.6^h *1*	Cs^{133}(240-Mev p)	chem
β^+		1.13 *5*		s
γ		0.213		s ce

p 17^dTe chem

R.W.Fink, Thesis, Univ. of Rochester (1953).

$I^{127}_{53\ 74}$ stable

Levels	I^{127}(n,n'γ)	E_n = 0.2 to 1.0	
	0.062 *2*	0.632 *6*	scin
	0.208 *2*	0.725 *10*	
	0.390?	1.000?	
	0.435		

D.A.Lind, J.J.Van Loef, Phys. Rev. 99(1955); BAPS 30, #3(Washington), F8(1955); verbal report; Phys. Rev. 98, 224A (1955).

Level	I^{127}(n,n'γ)	E_n = 0.2 to 2	
γ	(0.20)		

Yield indicates direct decay to g.s.

J.B.Guernsey, A.Wattenberg, Phys. Rev. 98 (195 (1955). BAPS 30, #1(New York), A1; verbal report.

γ		I^{127}(n,?γ)	E_n = 3.2	scin
		0.21 st	0.63	
		0.33	1.04 ?	
	st	0.42		

V.E.Scherrer, S.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

$I^{132}_{53\ 79}$ 2.26^h

			d 78^hTe	chem
τ		2.259^h *8*		ic

E.W.Emery, N.Veall, Nature 174, 889 (1954).

$Xe^{127}_{54\ 73}$ 36.4^d

γ		0.056	I^{127}(32-Mev p,n)	chem
	vw	0.145		scin
		0.170		
	st	0.200		
		0.368		

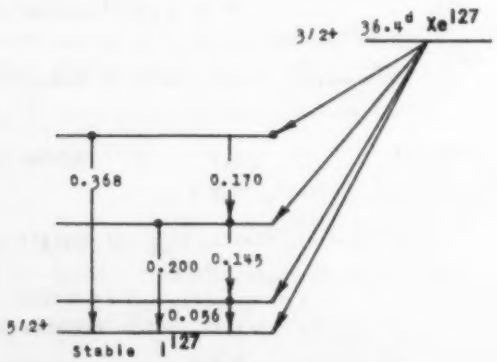
No β^+ (no $\gamma^\pm$) K x rays scin

(0.056 γ)(0.145 γ, 0.170 γ, K x rays)

(0.200 γ)(0.170 γ, K x rays)

(0.368 γ)(K x rays) No(0.368 γ) γ

No(0.200 γ)(0.056 γ, 0.145 γ)



H.S.Mathur, Phys. Rev. 97, 707 (1955).

$Xe^{137}_{54\ 83}$ 3.9^m

β^-		3.5	U(d,f)	I chem a
γ				

S.J.Nassif, W.Seelmann-Eggebert, Z.Naturf. 10a, 83 (1955).

$Xe^{138}_{54\ 84}$ 17^m

			U(30-Mev d,f) chem
β^-		2.4	
E_γ/β = 1.3 Mev			

S.J.Nassif, W.Seelmann-Eggebert, Z. Naturf. 10a, 83 (1955).

$Cs^{126}_{55\ 71}$ 1.6^m

τ		1.6^m *2*	d 96^mBa	chem ms
β^+		3.8 *4*		a, scin
γ		0.385 *5*		scin

No 0.48 γ (< 10% of 0.385 γ)

No γ with E_γ > 0.6 (< 13% of 0.385 γ)

β^+ : x : γ = 82 : 18 : 38

(0.385 γ)($\gamma^\pm$, << 3-Mev β^+) $\nu\beta^+$)

No (0.385 γ) (3.8 β^+)

M.I.Kalkstein, J.M.Hollander, Phys. Rev. 96, 730 (1954).

$Cs^{129}_{55\ 74}$ 31^h

			Ta^{181}(340-Mev p)	chem
γ	100†	0.375 *10*		scin
	9†	0.420 *10*		
	23†	0.585 *20*		

W.E.Nervik, G.T.Seaborg, Phys. Rev. 97, 1092 (1955).

$Cs^{131}_{55\ 76}$ 10^d

J		5/2	M
μ		+3.48 *4*	

E.M.Bellamy, K.F.Smith, Phil. Mag. 44, 33 (1953).

$Cs^{134}_{55\ 79}$ 3.15^h

J		8	M
μ		+1.10 *1*	

D.A.Gilbert, V.W.Cohen, Phys. Rev. 97, 243 (1955); 95, 569 (1954).

μ		> 0	M

L.S.Goodman, S.Wexler, Phys. Rev. 97, 242 (1955).

β^-	~1%	~0.55	Cs^{133}(11-Mev d,p)	sl
No 2.18 β^-				

G.L.Keister, E.B.Lee, F.M.Schmidt, Phys. Rev. 97, 451 (1955).

$Cs^{134}_{55\ 79}$ 2.3^y

J		4	M
μ		+2.95 *1*	

E.M.Bellamy, K.F.Smith, Phil. Mag. 44, 33 (1953).

$Cs^{134}_{55\ 79}$ 2.3^{y}

β^-	~32%	0.083 *3*	50%	0.655 *2*		sl
	~5%	0.31* *10*	~13%	0.683 *4*		
No ϵ	($<1\%$, from absence of e_A)					sl

			ce_K**		sl pe, ce
γ	2†	0.473 *2*	3		
	9†	0.563 *1*	11.9	K/L	
	13†	0.569 *1*	26		
	100†	0.605 *1*	100	7.7	
	91†	0.796 *1*	44	7.0	
	18†	0.801 *2*	3.9	K/LM	
	0.9†	1.038 *5*	0.43	~7	
	3.0†	1.168 *5*	0.49	~8	
	4.6†	1.367 *5*	0.49	~10	

0.203 γ not found (photons <0.2†, $ce_K < 1.2$*)
0.883 γ seen, probably Cs^{137}
No $\gamma\gamma$ delay ($<0.2^{\mu s}$) scin
$(0.796\ \gamma)(E_\beta > 0.1) / (0.605\ \gamma)(E_\beta > 0.1) = 1.3 \pm 0.2$
Few, if any, (high E_β) (0.563 + 0.569 γ)
*Mean value for 2 components.
**Relative intensity of ce_K

G.L.Keister, E.B.Lee, F.W.Schmidt, Phys. Rev. 97, 451 (1955); 86, 832A (1952).

β^-	25%	0.088 *4*	Cs^{133}(slow n,γ); s
	75%	0.654 *6*	

			α	K/LM
γ	10†	0.563 *2*	0.004	
	18†	0.569 *2*	0.006	
	100†	0.604 *2*		7.0
	100†	0.796 *3*		8.4
	8†	0.802 *3*	0.0026	
	1.1†	1.038 *4?*	0.002	7.6
	1.7†	1.166 *4?*	0.0015	8.4
	2.8†	1.367 *4*	0.0014	10.0

No β^+ ($<0.1\%$)

A.A.Bashilov, N.M.Anton'eva, M.V.Blinov, B.S.Dzhelepov, Izvest. Akad. Nauk Ser. Fiz. SSSR 18, 43 (1954).

β^-	25%	0.078 *5*	5%	0.410 *15*		sl
	2%	0.210 *5*	68%	0.657 *5*		

		α	sl pe, ce
γ	0.4720 *15*	9.6×10^{-3}	E2
	0.5651 *21*	2.8×10^{-3}	E1
	0.5707 *10*	1×10^{-2}	M1
	0.6037 *6*	7.2×10^{-3}	M1 + E2
	0.7976 *13*	2.8×10^{-3}	M1 + E2
	0.8037	5×10^{-3}	E3
	1.0374 *30*		
	1.1687 *22*	4.5×10^{-4}	E1
	1.3687 *40*	9×10^{-4}	M1 + E2
	1.402		

M.H.Forster, J.S.Wiggins, Phys. Rev. 99(1955) BAPS 30, #3 (Washington), V11(1955); verbal Report.

γ	4†	0.2004 *15*	sd ce, pc
	4†	0.2083 *15*	
	4†	0.4753 *30*	

(CONTINUED)

$Cs^{134}_{55\ 79}$ 2.3^{y}

	15†	0.5652 *7*
	20†	0.5709 *7*
	100†	0.6058 *7* K/L = 6.3
	2†	0.6818 *20*
	100†	0.7970 *6* K/L = 8.0
	15†	0.8022 *6*
	4†	1.0345 *30*
	4†	1.168 *3*
	4†	1.370 *3*

J.Verhaeghe, J.Demuynck, Compt. rend. 239, 1374 (1954).

γ	3.5†	0.467 *15*	sl pe
		0.553 *?*	
	21†	0.571 *?*	
	100†	0.607 *5*	
	100†	0.794 *3*	
		1.027 *15*	
	4†	1.164 *10*	
	5.3†	1.368 *5*	
		1.401 *15*	

M.C.Joshi, B.V.Thosar, Phys. Rev. 96, 1022 (1954).

γ sum peaks	1.175	Σscin
	1.400	
	1.972	

D.C.Lu, M.L.Wiedenbeck, Phys. Rev. 94,501 (1954).

No delayed $\beta\gamma$ ($\tau_\gamma < 5 \times 10^{-10}$s)

V.Z.Winterstelger, Bull. Inst. Nuclear Sci., Boris Kidrich 4, 79 (1954).

No ϵ_K ($<0.2\%$) (No Xe K x ray) 4π pc, cryst

M.Jaffe, UCRL-2537 (1954).

Ba_{56}

γ	Ba(n,?γ)		E_n = 3.2	scin
st	0.47		1.19	
	0.60	st	1.41	
	0.78		1.51	
	1.06		2.1	

V.E.Scherrer, B.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

Resonances Ba(n,γ) E_n = 0.025 to 500 ev

E_o (ev)	$\sigma_\alpha \Gamma^2$	mod cyc
25	8	
93	90	
380	550	

E.Meservey, Phys. Rev. 96, 1006 (1954); 86, 605A (1952).

Ba^{124}? 56 68 ~12^m

τ ~12^m In$^{(115)}$(140-Mev N^{14},5n) chem

Possibly Ba^{127} but 6.3^hCs^{127} not detected

M.I.Kalkstein, J.M.Hollander, Phys. Rev. 96, 730 (1954).

Ba^{126} 56 70 96^m

τ		96.5^m *2.0*	p 1.6^{m}Cs	chem
			In$^{(115)}$(140-Mev N^{14},3n)	
γ	100†	0.225 *10*		scin
	33†	0.700 *30*		
	w	0.9 ?		
x	st	K x ray		

(0.225 γ) (0.70 γ) ?

M.I.Kalkstein, J.M.Hollander, Phys. Rev. 96, 730 (1954).

Ba^{127}? 56 71 ~12^m

τ ~12^m In$^{(115)}$(140-Mev N^{14},2n) chem

6.3^hCs^{127} not detected, activity possibly Ba^{124}

M.I.Kalkstein, J.M.Hollander, Phys. Rev. 96, 730 (1954).

Ba^{131} 56 75 13^d

γ	st	0.122	α~0.6	st	0.496	scin
	st	0.214		w	0.618	
	m	0.372		w	1.09*	

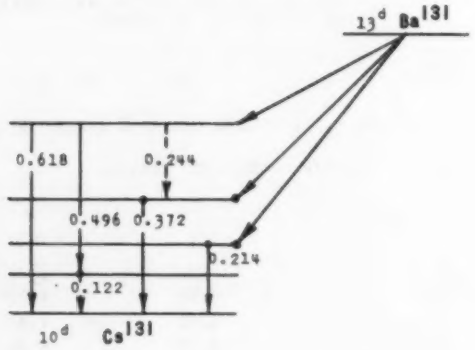
No 0.048 γ, 0.065 γ, 0.108 γ

(K x ray)(0.122 γ, 0.214 γ, 0.372 γ) Σ scin

(0.122 γ)(0.496 γ) No(0.214 γ)(0.372 γ)

No(0.122 γ)(0.214 γ, 0.372 γ)

*May be due to impurity



D.C.Lu, W.H.Kelly, M.L.Wiedenbeck, Phys. Rev. 97, 139 (1955).

Ba^{136} 56 80 stable

Resonances Ba^{135}(n) chopper

E_o(ev)	Γ_n (10^{-3}ev)	Γ_γ (10^{-3}ev)
24.5	8.5	108
82.6	~180	~80
88.4		

A.Stolovy, J.A.Harvey, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), B9(1955); priv. comm.

Ba^{137} 56 81 2.60^m

γ (0.662) d ^{33y}Cs sd ce

K : L : LM : MN = 52 : 10 : 13 : 2.8

J.Verhaeghe, J.Demuynck, Compt. rend. 239, 1374 (1954).

Ba^{137} 56 81 stable

Resonance Ba^{136}(n) chopper

E_o(ev)
106.9

A.Stolovy, J.A.Harvey, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), B9(1955); priv. comm.

La^{138} 57 81 2x10^{11}y

J 5 I

μ +3.6848 *4*

$Q(La^{138})/Q(La^{139}) \cong 3.5 \pm 0.5$*

P.B.Sogo, C.D.Jeffries, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), BA9(1955); *verbal report.

La^{140} 57 83 40.2^h

τ 40.31^h *6* 47

$La^{(139)}$(th n,γ)

L.Yaffe, N.G.Thode, W.F.Merritt, R.C.Hawkins, F.Brown, R.W.Bartholomew, Can. J. Chem. 32, 1017 (1954).

τ 40.5^h *6*

β^-	16%	0.42 *4*		s
	12%	0.86 *3*		
	20%	1.15 *3*		
	30%	1.36 *2*		
	14%	1.62 *2*		
	8%	2.20 *2*		
γ	1.3*	0.331 *2*	K : L : M = 100 : 14 : 6	
	0.46*	0.486 *3*	K : L : M = 32 : 8 : 4	
	0.10*	0.810 *3*		
	0.14*	1.60 *1*	K : L = 11 : 2	

*ce per 100 β^-

A.A.Bashilov, B.S.Dzhelepov, L.S.Chervinskaya, Izvest. Akad. Nauk Ser. Fiz. SSSR 18,88(1954).

			α	
γ	40+	0.328	~0.004	sl ce,scin
	6+	0.438		
	50+	0.490	~0.007	
	46+	0.815	~0.031	
	100+	1.60	~0.0008	
	1+	2.50 *5*		scin
	0.04+	3.00 *20*		

No (0.490 γ)(0.815 γ)

(0.490 γ)(1.60 γ)(θ)	J = 4, 2, 0
(0.815 γ)(1.60 γ)(θ)	Anisotropy < +5%, not < 0
(0.328 γ)(0.490 γ)(θ)	Anisotropy < 0
(0.328 γ)(1.60 γ)(θ)	Anisotropy < 0

C.M.Pruett, H.H.Bolotin, P.L.Roggenkamp, R.G. Wilkinson, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), YA2(1955); verbal report.

La^{140} 57 83 40.2h

Resonance — La^{139}(n), chopper

E_o(ev)	Γ_n(10^{-3}ev)	Γ_γ(10^{-3}ev)
73.5	24	147

A.Stolovy, J.A.Harvey, Phys. Rev. 99(1955); BAPS 30, #3(Washington), B9(1955); priv.comm.

Ce 58

γ	Ce(n,?γ)	E_n = 3.2	scin
	0.48	1.50	
	0.90	2.5	

V.E.Scherrer, B.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

Ce^{139} 58 81 140d

La^{139}(11-Mev d,2n) chem

γ 0.1665 α_K = 0.20 sm ce, scin

K : L : MN = 82 : 10 : 2.5 M1

No harder γ (< 0.1%) No other ce

No β^+

K x ray/0.166γ = 1.0 ± 0.2 scin

e_A/ce_K = 0.84 sm

ϵ_K/ce_K = 4.4 ± 0.2 $(x\gamma/\gamma)/(xx/x)$

(K x ray)(0.166γ) delay < 10^{-8}s scin

$E_e \leq 0.15$ (to 0.166 level) from coincidence and single counting rates

C.M.Pruett, R.G.Wilkinson, Phys. Rev. 96, 1340 (1954); Phys. Rev. 95, 625A.

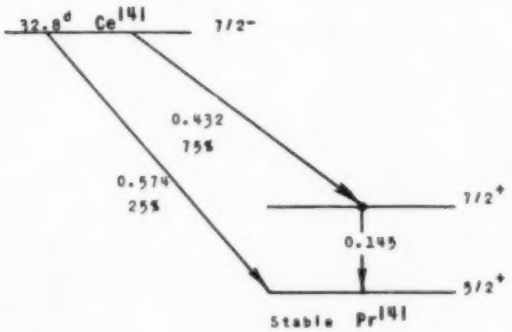
Ce^{141} 58 83 32.8d

Ce^{140}(pile n,γ) chem

β^-	75%	0.432	2	F-K linear	sl $\beta\gamma$
	25%	0.574	3	F-K linear	sl
γ		0.1449	7	α_K = 0.22	K/L=6.3±1

No other γ's sl ce,pe;scin

(0.432β)(0.145γ) No (0.574β)(0.145γ)



J.T.Jones, Jr., E.N.Jensen, Phys. Rev. 97, 1031 (1955).

Resonances — Ce^{140}(n) E_n = 0.5 to 60 kev Li(p,n)

	E_o(kev)	
	2.8	1.0
	6.7	1.0
st	10	1
st	22	1
st	43	1

R.C.Block, H.W.Newson, Phys. Rev. 98 (1955); BAPS 30, #1 (New York), HA10; verbal report.

Ce^{143} 58 85 33h

Ce^{142}(pile n,γ)

β^-	~0.3	(1.09)	scin $\beta\gamma$
	~0.5	(1.38)	
	(0.71)		

γ				
	0.0574	2	α_K ~ 9	sl ce,scin
	0.232	1		0.668 2
	0.294	1		0.724 2
	0.351	1		0.861 5
	0.493	2		1.10 1*
	0.565	5*		*No ce

(1.38β)(0.057γ) delay < $1^{\mu s}$

(0.057γ)(0.294γ) (0.232γ)(0.493γ)

β to g.s. weak if present

D.W.Martin, J.M.Cork, S.B.Burson, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), YA1(1955); verbal report.

Levels — Ce^{142}(d,p) E_d = 15.1

g.s.	Q = 2.86 ?	scin
0.90 15		

N.S.Wall, Phys. Rev. 96, 664 (1954).

Resonances — Ce^{142}(n) E_n = 0.5 to 125 kev Li(p,n)

	E_o(kev)
vst	1.6 1.0
st	3.2
st	4.2
w	9
st	16
st	26
st	44
	95

R.C.Block, H.W.Newson, Phys. Rev. 98 (1955). BAPS 30, #1 (New York), HA10 (1955).

Ce^{144} 58 86 290d

β^-	20%	0.160 15	U(n,f)chem	sd
	~5%	0.258 15		
	75%	0.327 7		

γ			
	0.0338		sm ce
	0.0408		
	0.0532		
	0.0590	K/L < 1	No L_2
	0.0799		
	K : L_1 : L_3 = 345 : 100 : ~15		
	0.0950		
	0.1335		
	K : L_1 : L_2 : L_3 = 65 : 10 : 0 : ~1		
	0.1452		

No 0.0468γ, 0.0603γ, 0.100γ, 0.231γ

(0.134γ)(0.033γ, 0.041γ)

(0.080γ)(0.041γ, 0.145γ?)

J.M.Cork, M.K.Brice, L.C.Schmid, Phys. Rev. 96, 1295 (1954).

γ			
	29†	(0.081)	Σ scin
	100†	(0.134)	

W.E.Kreger, C.S.Cook, Phys. Rev. 96, 1276 (1954).

Pr^{135} 59 76 22^m

τ	22^m	p 22^hCe	
		Ce^{136}(22-Mev p,2n)	chem
		Not by Ce^{136}(9.5-Mev p,n)	
β^+	2.5 *1*		a,scin
γ	0.080		scin
	0.22		
	0.30		

T.H.Handley, E.L.Olson, Phys. Rev. 96, 1003 (1954).

Pr^{136} 59 77 70^m

τ	70^m	Ce^{136}(9.5-Mev p,n)	chem
β^+	2.0 *1*		a,scin
γ	0.17		scin
	~0.8 ?		
	~1.1 ?		

T.H.Handley, E.L.Olson, Phys. Rev. 96, 1003 (1954).

Pr^{137} 59 78

τ	$>1^y$ or $<5^m$		scin
No 1.4^h activity		Ce^{138}(22-Mev p)	chem

T.H.Handley, E.L.Olson, Phys. Rev. 96, 1003 (1954).

Pr^{138} 59 79 2.0^h

τ	2.0 *1*	Ce^{138}(9.5-Mev p,n)	chem
β^+	1.4 *1*		a,scin
γ	0.30	~1.4 ?	scin
	0.80	~1.7 ?	
	1.05		

T.H.Handley, E.L.Olson, Phys. Rev. 96, 1003 (1954).

Pr^{139} 59 80 4.5^h

	Nd^{142}(18-Mev p,α); $Ce^{(140)}$(fast p,2n)		
τ	4.5^h	p 140^dCe	chem
β^+	1.0 *1*		a,scin
γ	0.17	in 140^dCe	scin
	1.3		
	1.6		

T.H.Handley, E.L.Olson, Phys. Rev. 96, 1003 (1954).

Pr^{140} 59 81 3.5^m

τ	3.4^m	Pr^{141}(22-Mev p,pn)	chem
		$Ce^{(140)}$(9.5-Mev p,n)	chem

T.H.Handley, E.L.Olson, Phys. Rev. 96, 1003 (1954).

Pr^{141} 59 82 stable

Level	$Pr^{(141)}$ (γ,γ)		
γ	(0.145)	$\tau = 3.5\times10^{-9}$s	

Ce^{141} source rotated to compensate for recoil

F.R.Metzger, Phys. Rev. 99(1955); BAPS 30,#3 (Washington), BA8(1955).

Pr^{142} 59 83 19.2^h

γ	1.6	Pr^{141}(pile n,γ)	scin

No other γ

B.Saraf, J.Varma, C.E.Mandeville, Phys. Rev. 98 (1955).
BAPS 30, #1(New York), SP1.

Levels Pr^{141}(d,p) E_d = 15.1

g.s.	Q = 3.42 *30*		scin
0.62 *10*			

N.S.Wall, Phys. Rev. 96, 664 (1954).

Pr^{143} 59 84 13.8^d

No γ ($<10^{-3}$%)		scin

B.Saraf, J.Varma, C.E.Mandeville, Phys. Rev. 98 (1955).
BAPS 30, #1(New York), SP1.

Pr^{144} 59 85 17.5^m

β^-	1.5%	0.92	U(n,f)	chem sd
	98.5%	3.12		
γ		0.688		scin
		1.49		
		2.18		

No 0.0603γ sm ce

J.M.Cork, M.K.Brice, L.C.Schmid, Phys. Rev. 96, 1295 (1954).

γ	12†	(0.695)	d 290^dCe	scin
	2.3†	(1.48)		
	5.9†	(2.18)		

†Photons per 100 Ce^{144} 0.134 photons

W.E.Kreger, C.S.Cook, Phys. Rev. 96, 855A, 1276 (1954).

Nd 60

Resonance	Nd(n) E_o(ev)		chopper
	161		

A.Stolovy, J.A.Harvey, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), 8B(1955); priv. comm.

Resonance	Nd(n) E_o(ev)	E_n = 0.07 to 20 ev $\sigma_o\Gamma^2$	cryst s
	4.38 *4*	1-10	

V.L.Sailor, H.H.Landon, H.L.Foote, Jr., Phys. Rev. 96, 1014 (1954).

Nd^{143} 60 83 stable

μ	-1.1 *1*	Enriched Nd^{143}	S

K.Murakawa, Phys. Rev. 96, 1543 (1954).

Nd^{143}(n,n'γ) E_n = 5.7

No γ with $E_\gamma < 0.50$ scin

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), X6.

Nd^{143} 60 83 stable

Levels $Nd^{142}(d,p)$ $E_d = 15.1$

g.s. $Q = 3.79$ *8* scin

0.70 *10*

N.S.Wall, Phys. Rev. 96, 664 (1954).

Nd^{144} 60 84 stable

$Nd^{(144)}(p,p'\gamma)$ $E_p = 3.34$

0.696 γ not observed ($\sigma < 0.6$ mb) scin

B.E.Simmons, D.M.Van Patter, K.F.Famularo, R.V.Stuart, Phys. Rev. 97, 89 (1955).

Resonances $Nd^{143}(n)$ chopper

E_o(ev)
56.3
132
191

A.Stolovy, J.A.Harvey, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), 89(1955); priv. comm.

Nd^{145} 60 85 stable

μ −0.69 *10* Enriched Nd^{145} S

K.Murakawa, Phys. Rev. 96, 1543 (1954).

Level $Nd^{145}(\alpha,\alpha'\gamma)$ $E_\alpha = 5.7$

γ 0.070 *2* $\epsilon B(E2) = 0.05$ scin

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), X6; verbal report.

Nd^{145} 60 85 stable

Level $Nd^{(145)}(p,p'\gamma)$ $E_p \leq 3.34$

γ 0.071 *4* scin

B.E.Simmons, D.M.Van Patter, K.F.Famularo, R.V.Stuart, Phys. Rev. 97, 89 (1955).

Nd^{146} 60 86 stable

Level $Nd^{146}(\alpha,\alpha'\gamma)$ $E_\alpha = 5.7$

γ 0.455 *10* $\epsilon B(E2) = 0.6$ scin

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), X6; verbal report.

$Nd^{(146)}(p,p'\gamma)$ $E_p = 2.79$

0.455 γ not observed ($\sigma < 1$ mb) scin

B.E.Simmons, D.M.Van Patter, K.F.Famularo, R.V.Stuart, Phys. Rev. 97, 89 (1955).

Resonances $Nd^{145}(n)$ chopper

E_o(ev)	Γ_n(10^{-3}ev)	Γ_γ(10^{-3}ev)
4.32	0.90	55
43.2		
82.3 ?		
106		

A.Stolovy, J.A.Harvey, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), 89(1955); priv. comm.

Nd^{148} 60 88 stable

Level $Nd^{148}(\alpha,\alpha'\gamma)$ $E_\alpha = 5.7$

γ 0.300 *8* $\epsilon B(E2) = 1.2$ scin

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), X6; verbal report.

Level $Nd^{(148)}(p,p'\gamma)$ $E_p = 2.2$ to 3.8

γ 0.300 *3* $\tau = 2.6\times10^{-10}$s* scin

σ ($E_p = 2.25$) = 0.7 mb

*Estimated assuming E2 Coulomb excitation

B.E.Simmons, D.M.Van Patter, K.F.Famularo, R.V.Stuart, Phys. Rev. 97, 89 (1955).

Nd^{150} 60 90 $>10^{15}$y

τ_β $>10^{16}$y pc

No β's with $0.006 < E_\beta < 0.3$ from 1.18g natural Nd(2.1 mg/cm^2)

D.Dixon, A.McNair, Phil. Mag. 45, 1099(1954).

Level $Nd^{150}(\alpha,\alpha'\gamma)$ $E_\alpha = 5.7$

γ 0.128 *3* $\epsilon B(E2) = 1.2$ scin

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 98, (1955).
BAPS 30, #1 (New York), X6; verbal report.

Level $Nd^{150}(p,p'\gamma)$ $E_p = 1.8$ to 3.3

γ 0.131 *2* $\tau = 7\times10^{-9}$s* scin

Graph of σ agrees with E2 Coulomb excitation

(p)(0.131γ)(θ) σ ($E_p = 2.25$) = 2.4 mb

*Estimated assuming E2 excitation

B.E.Simmons, D.M.Van Patter, K.F.Famularo, R.V.Stuart, Phys. Rev. 97, 89 (1955).

Pm^{149} 61 88 50^h

Nd^{150}(9-Mev p,2n) chem

β^- 0.97 s

γ 0.285 scin

~1.0

V.K.Fischer, Phys. Rev. 96, 1549 (1954).

Pm^{150} 61 89 2.7^h

τ 2.7^h Nd^{150}(9-Mev p,n) chem

β^-	~80%	2.01 *5*			sd
	~20%	3.05 *5*			
γ	100†	0.34 *1*		1.24?	scin
		0.39?	4†	1.32 *5*	
	20†	0.43 *2*	0.8†	1.67 *5*	
	40†	0.82 *2*	0.4†	2.0 *1*	
		0.96?	0.8†	2.6 *1*	
	4†	1.17 *5*	0.4†	3.0 *1*	

($E_\beta = 2$) (0.34, 0.43, 0.82, 1.17γ's)
($E_\beta = 2$) (1.32, 1.67, < 2.5 γ's)
($E_\beta = 3$) (0.39?, 0.82, 1.24?, 1.32 γ's)
(0.34γ)(0.39?, 0.43, 0.82, 1.32, 1.67, < 2.0γ's)
Decay scheme proposed scin

V.K.Fischer, Phys. Rev. 96, 1549; 95, 626A (1954).

$_{62}$Sm Resonances $Sm(n)$ E_n = 0.07 to ~22 ev

E_o (ev)		$\sigma_o\Gamma^{2*}$	Isotope**	cryst
0.0976	5	68 68	150	
0.871	5	10-50	150	
3.43	2	1-10	148	
4.98	5	1-10	150	
6.45	10	1-10	150 ?	
8.2	1	>100	153	
9.1	2	1-10	150 ?	
12.0	5	1-10		
15.2	5	1-10	150 ?	
17.2	5	1-10	150 ?	
19.1	5	50-100	148	
27.1	5	50-100	151	

*For natural Sm **Enriched samples used

V.L.Sailor, H.H.Landon, H.L.Foote, Jr., Phys. Rev. 96, 1014 (1954); 89, 904A (1953).

$_{62}^{147}$Sm $_{85}$ $_{1.25\times10^{11}y}$ $Sm^{147}(\alpha,\alpha'\gamma)$ E_α = 5.7

No γ with E_γ < 0.50 scin

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 98, (1955).
BAPS 30, #1 (New York), X6.

$_{62}^{148}$Sm $_{86}$ stable

Level	$Sm^{148}(\alpha,\alpha'\gamma)$	E_α = 5.7	
γ	0.562 12	$\epsilon B(E2)$ = 1.32	scin

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 98, (1955).
BAPS 30, #1 (New York), X6; verbal report.

Resonances $Sm^{147}(n)$ E_n = 0.07 to ~22 ev

E_o (ev)		$\sigma_o\Gamma^2$	cryst
3.43	2	10-50	
19.1	5	>100	

See also Sm

V.L.Sailor, H.H.Landon, H.L.Foote, Jr., Phys. Rev. 96, 1014 (1954); 89, 904A (1953).

$_{62}^{149}$Sm $_{87}$ stable

$Sm^{149}(\alpha,\alpha'\gamma)$ E_α = 5.7

No γ with E_γ < 0.50 scin

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), X6.

$_{62}^{150}$Sm $_{88}$ stable

Level	$Sm^{150}(\alpha,\alpha'\gamma)$	E_α = 5.7	
γ	0.337 7	$\epsilon B(E2)$ = 1.90	scin

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), X6; verbal report.

$_{62}^{150}$Sm $_{88}$ stable

Resonances $Sm^{149}(n)$ E_n = 0.07 to ~22 ev

E_o (ev)		$\sigma_o\Gamma^2$	cryst
0.0976	5	490	
0.871	5	>100	
4.98	5	10-50	
6.45	10*	10-50	
9.1	2*	10-50	
15.2	5*	10-50	
17.2	5*	10-50	

*Assignment uncertain See also Sm

V.L.Sailor, H.H.Landon, H.L.Foote, Jr., Phys. Rev. 96, 1014 (1954); 89, 904A (1953).

$_{62}^{151}$Sm $_{89}$ $_{\sim 70^y}$ Resonance $Sm^{150}(n)$ E_n = 0.07 to ~22 ev

E_o (ev)	$\sigma_o\Gamma^2$	cryst
21.1 5	>100	

See also Sm

V.L.Sailor, H.H.Landon, H.L.Foote, Jr., Phys. Rev. 96, 1014 (1954); 89, 904A (1953).

$_{62}^{152}$Sm $_{90}$ stable

Level	$Sm^{152}(\alpha,\alpha'\gamma)$	E_α = 5.7	
γ	0.122 2	$\epsilon B(E2)$ = 1.4	scin

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 98, (1955).
BAPS 30, #1 (New York), X6; verbal report.

$_{62}^{153}$Sm $_{91}$ $_{47^h}$

β^-	67-45†	0.710		sl (β) (0.103γ)
	33-55†	0.640		sl (β) (0.103γ)

M.Marty, J. Phys. radium 15, 605 (1954).

β^{-**}	32%*	0.640 15		sl
	49%*	0.710 15		
	19%*	0.810 10		
γ	100†*	0.0690 4	α = 8	sl ce, scin
			K/L> 4.8	
		0.1025 5	K/L> 8.1	
			$\tau = 4.0\times10^{-9}$s	β(ce)
	0.033†*	0.1716	K/L = 4.5*	
			$\tau = 1.4\times10^{-10}$s	β(ce)
	w	0.520		

(0.64 β) (0.1025 γ) (0.71 β) (0.069 γ)
†ce per 100 β^-
**Spectrum analyzed only for E_β > 0.35

R.L.Graham, J.Walker, Phys. Rev. 94, 794A (1954); *priv. comm.

Resonance $Sm^{152}(n)$ E_n = 0.07 to ~22 ev

E_o (ev)	$\sigma_o\Gamma^2$	cryst
8.2 1	>100	

See also Sm

V.L.Sailor, H.H.Landon, H.L.Foote, Jr., Phys. Rev. 96, 1014 (1954); 89, 904A (1953).

Sm^{154} 62 92 stable

Level	$Sm^{154}(\alpha,\alpha'\gamma)$	$E_\alpha = 5.7$	
γ	0.082 *2*	$\epsilon B(E2) = 0.5$	scin

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 98, (1955).
BAPS 30, #1 (New York), X6; verbal report.

Eu^{151} 63 88 stable

J	5/2	para

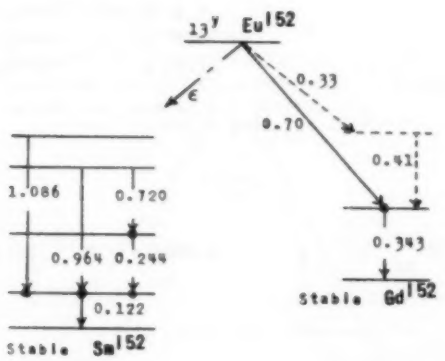
$\mu(Eu^{151})/\mu(Eu^{153}) = 2.24 \pm 0.03$

B.Bleaney, W.Low, Proc. Phys. Soc. 68A, 55 (1955).

Eu^{152} 63 89 13^y

β^-	0.33 *10?*	$Eu^{152,154}$ source		sl
	0.70 *3*			$\beta\gamma$
γ	(0.122)* sl ce	0.41 ?		scin
	(0.244)* sl ce	(0.720)		scin
	(0.343)* sl ce	(0.964)		scin
No 0.336 γ		(1.086)		scin
(0.70 β) (ce_K 0.343 γ)				sl
No β (ce_L 0.122 γ, ce_K 0.244 γ)				sl
(ce 0.122 γ) (ce 0.244 γ, no ce 0.123 γ)				sl
(x ray) (0.122 γ, 0.244 γ, 0.964 γ?)				Σ scin
Sum peaks also at ~1.14? ~1.26				Σ scin
No (0.343 γ) (x ray, γ)				Σ scin

*Assignment from ms results of Katz, Lee



R.E.Slattery, D.C.Lu, M.L.Wiedenbeck, Phys. Rev. 96, 465 (1954).

Resonance $Eu^{(151)}$ (n) $E_n = 0.001$ to 0.01 ev
-0.0006 ev $\sigma_o = 8.4 \times 10^4$ cryst
$\Gamma_\gamma = 0.067$

M.Holt, Phys. Rev. 98 (1955)
BAPS 30, #1(New York), HA11.

Eu^{153} 63 90 stable

J	5/2	para

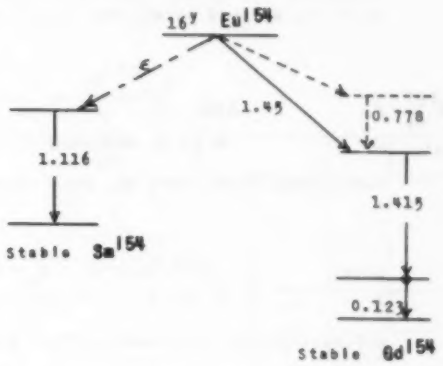
$\mu(Eu^{151})/\mu(Eu^{153}) = 2.24 \pm 0.03$

B.Bleaney, W.Low, Proc. Phys. Soc. 68A, 55 (1955).

Eu^{154} 63 91 16^y

β^-	1.45 *5*	$Eu^{152,154}$ source		sl
γ	(0.123)*	(1.116)*		scin
	(0.778) ?	1.415**		
No 0.336 γ				
(1.415 γ) (x ray, 0.123 γ)				Σ scin
No (0.123 γ) (x ray)				Σ scin
No (0.778 γ) (x ray, γ)				Σ scin
No (ce_L 0.123 γ)β				sl

*Assignment from ms results of Katz, Lee
**Assignment from coincidences



R.E.Slattery, D.C.Lu, M.L.Wiedenbeck, Phys. Rev. 96, 465 (1954).

Gd 64

Resonances Gd(n) $E_n = 0.07$ to ~ 35 ev cryst

E_o(ev)	$\sigma_o\Gamma^2$
2.01 *1*	1-10
2.57 *2*	10-50
2.81 *3*	1-10
6.33 *6*	10-50
7.8 *1*	1-10
11.9 *2*	
16.9 *4*	
21.1 *5*	
22.5 *6*	
30.8 *8*	
34.0 *10*	

V.L.Sailor, H.H.Landon, H.L.Foote, Jr., Phys. Rev. 96, 1014 (1954).

Gd^{154} 64 90 stable

Level	$Gd^{154}(\alpha,\alpha'\gamma)$	$E_\alpha = 5.7$	
γ	0.123 *2*	$\epsilon B(E2) = 2.1$	scin

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 98, (1955).
BAPS 30, #1 (New York), X6; verbal report.

Gd^{155} 64 91 stable

J	$\geq 5/2$	S
μ	-0.19 *5* assuming J = 7/2	

K.Murakawa, Phys. Rev. 96, 1543 (1954).

Gd^{155} 64 91 stable

Level — $Gd^{155}(\alpha,\alpha'\gamma)$ $E_\alpha = 5.7$
γ 0.146 *3* $\epsilon B(E2) = 0.11$ scin

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), X6; verbal report.

Gd^{156} 64 92 stable

Level — $Gd^{156}(\alpha,\alpha'\gamma)$ $E_\alpha = 5.7$
γ 0.089 *2* $\epsilon B(E2) = 1.2$ scin

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), X6; verbal report.

Gd^{157} 64 93 stable

J ≥5/2 S
μ −0.33 *6* assuming J = 7/2

K.Murakawa, Phys. Rev. 96, 1543 (1954).

Level — $Gd^{157}(\alpha,\alpha'\gamma)$ $E_\alpha = 5.7$
γ 0.131 *3* $\epsilon B(E2) = 0.08$ scin

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 98, (1955).
BAPS 30, #1 (New York), X6; verbal report.

Gd^{158} 64 94 stable

Level — $Gd^{158}(\alpha,\alpha'\gamma)$ $E_\alpha = 5.7$
γ 0.079 *2* $\epsilon B(E2) = 1.0$ scin

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), X6; verbal report.

Tb^{159} 65 94 stable

J 3/2 para
μ 1.5 *4*

J.M.Baker, B.Bleaney, Proc. Phys. Soc. 68A, 257 (1955).

γ — $Tb^{159}(\alpha,\alpha'\gamma)$ $E_\alpha = 5.7$
0.079 *2* $\epsilon B(E2) = 0.19$ scin
0.136 *3* $= 0.04$
σ graphs show both γ's from 0.136 level

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), X6; verbal report.

Tb^{160} 65 95 73d

τ 72.3d *5*

β^-	19%	0.28 *4*	32%	0.557 *15*	s
	19%	0.46 *2*	30%	0.851 *10*	
γ		0.064	0.297		s ce,pe
		0.0862	0.391	0.962	
		0.093	0.411	0.976	
		0.156	0.466	1.034	
		0.181	0.569	1.110	
		0.196	0.679	1.173	
		0.214	0.762	1.196	
		0.234	0.856	1.250	
		0.274	0.876	1.266	
		0.282	0.915	1.447	

(CONTINUED)

Tb^{160} 65 95 73d

$(ce_L\ 0.086\gamma)(ce_K\ 0.196\gamma, ce_K\ 0.297\gamma)$ s ce
The above 29 most intense γ's (out of 70 γ's found) fitted into 8 levels

V.Koshlshian, H.W.Kruse, R.J.Klotz, C.M.Fowler, Phys. Rev. 96, 1050 (1954).

Tb^{159}(pile n,γ)

γ 0.0869 *3* $\alpha_K \leq 1.7$ cryst
No ϵ_K (<0.7%) (Dy K x ray <0.6%) 4π pc

γ	12†	0.087	34†	0.96	scin
	5†	0.195	25†	1.18	
	14†	0.290	11†	1.27	
	34†	0.89	16†	K x rays	

(1.18 or 1.27 γ)(0.087 γ and no other γ)
(0.087 γ)(0.89 γ) No (0.087 γ) (0.96 γ)
†Photons per 100 disintegrations

H.Jaffe, UCRL-2537 (1954).

Resonances Tb^{159}(n) E_n = 0.07 to 13 ev

E_o (ev)	$\sigma_o\Gamma^2$	cryst
3.37 *3*	10-50	
5.4 *2 ?*	1-10	
10.6 *3*	10-50	
11.4 *2*	50-100	

V.L.Sailor, H.H.Landon, H.L.Foote, Jr., Phys. Rev. 96, 1014 (1954).

Tb^{161} 65 96 6.8d

γ 0.0488 *2* Tb^{159}(pile n) cryst

H.Jaffe, UCRL-2537 (1954).

Dy 66

Resonances Dy(n) E_n = 0.07 to ~80 ev

E_o (ev)	$\sigma_o\Gamma^2$	cryst
1.72 *1*	10-50	
2.73 *2*	1-10	
3.70 *3*	1-10	
4.36 *5*	1-10	
5.49 *4*	>100	
7.8 *2*		
9.9 *5*	<1	
10.6 *15*	10-50	
13.5 *5*		
16.8 *3*		
19.7 *5*		
74 *15*	50-100	

V.L.Sailor, H.H.Landon, H.L.Foote, Jr., Phys. Rev. 96, 1014 (1954); 91, 450A (1953).

$Ho^{160}_{67\ 93}$ 5.0^h

τ	5.0^h	d	29^{h}Er chem
γ	0.087		scin
	0.194		
	0.65		
	0.73		
	0.89		
	0.97		

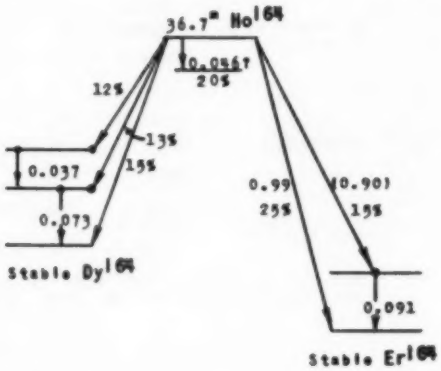
Formerly assigned to Ho^{162} (see Phys. Rev. 94, 945, 1954).

W.E.Nervik, G.T.Seaborg, Phys. Rev. 97, 1092 (1955).

$Ho^{164}_{67\ 97}$ 36.7^m

τ	36.7^m 5	Ho^{165} ($\leq$22-Mev γ,n)	
β^-	38† (0.90)		
	62† 0.99 3		sd
No β^+ ($<$ 0.08†)			scin
γ	3.6† 0.0378 5	$\alpha_L \sim 10$	pc,sd ce
	0.046	IT?	
	3.3† 0.0728 5	$\alpha_K = 2.7$ E2	xx/xy
		$\tau = 1.4\times10^{-9}$s ?	xy
	3.5† 0.0905 5	$\alpha_K = 1.9$ E2	βx/$\beta\gamma$
		$\tau = 1.4\times10^{-9}$s	$\beta\gamma$
x	90† K x ray + 0.046γ		
No Ho K x ray ($<$ 27†)		No Er K x ray ($<$ 18†)	

(β) (ce 0.091γ) No (β) (ce 0.046γ) sd
(β) (x ray)/(β) (0.091γ) = 1.8
(x ray) (0.037γ, 0.073γ),
No (0.037γ)(0.073γ)
Assignment to IT based on:
ϵ_K/β = 0.9 ± 0.2 from x/β = 0.9 ± 0.2
($<$ 0.164-Mev pulses)/β = 1.30 ± 0.15 Σ scin



H.W.Brown, R.A.Becker, Phys. Rev. 96, 1372 (1954); 95, 626A (1954).

$Ho^{166}_{67\ 99}$ 27.3^h

β^-	0.76%	0.393		sl $\beta\gamma$
	47.6%	1.771 7	$\Delta J = 2$, yes	shape sl $\beta\gamma$
	51.6%	1.854 5	F-K plot linear	sl
γ		0.0803 2	$\alpha_K = 1.9$	E2 sl ce
			K : L : MN = 10 : 25 : 7	
	0.76%	1.380	$\alpha_K = 1.7\times10^{-3}$	E2

No 0.184γ ($ce_K < 10^{-3}$%)
(1.77 β)(0.080γ, ce_L 0.080γ) delay = 1.8×10^{-9}s
(1.77 β)(0.080γ)(θ) J = 0, 2, 0 assuming same attenuation as for $\gamma\gamma(\theta)$

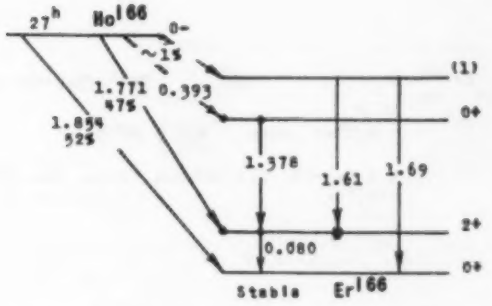
R.L.Graham, J.L.Wolfson, N.A.Clark, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), MA11; verbal report.

$Ho^{166}_{67\ 99}$ 27.3^h

γ	0.080	scin
	1.378 7	
	1.61 2	
	1.69 2	

(0.080γ)(1.38γ)(θ) J = 0, 2, 0
(0.080γ)(1.61γ)(θ) J = 1, 2, 0
No (0.080γ)(1.69γ)
Attenuation of $\gamma\gamma(\theta)$ coefficients shows quadrupole interaction

J.S.Fraser, J.C.D.Milton, Phys. Rev. 98(1955). Proc. Roy. Soc. Canada 48, 12A (1954).
BAPS 30, #1 (New York), MA10.



R.L.Graham, J.L.Wolfson, N.A.Clark, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), MA11; verbal report.

$Ho^{166}_{67\ 99}$ >30^y

γ	0.0803 2		sl ce
	0.1841 10		
	0.282 4		

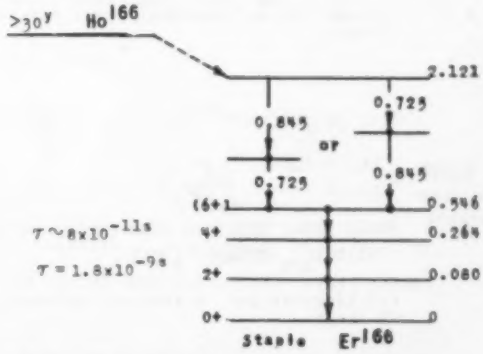
(0.080γ)(0.184γ) delay = 18.2 ± 0.6×10^{-10}s
(0.184γ)(0.282γ) delay = 8 ± 5×10^{-11}s scin
g.s. and first 3 excited states form a rotational band (from energy spacing)

R.L.Graham, N.A.Clark, Phys. Rev. 98 (1955); quoted by Milton, Fraser, Milton.
BAPS 30, #1 (New York), MA12; verbal report.

Ho^{165}(pile n,γ) chem

γ	1†	0.080	scin
	~1†	0.188 5	
	~1†	0.283 10	
	~1†	0.725 20	
	~1†	0.845 20	

(0.080γ)(0.188γ)(θ) J = 4, 2, 0*
All 5 γ's in cascade $\gamma\gamma$ scin
(0.725γ, 0.845γ)(most of the x rays)*
Delay 0.264 level ~8×10^{-11}s*
No $\beta\gamma$ delay ($<$ 2×10^{-9}s)



J.C.D.Milton, J.S.Fraser, G.M.Milton, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), MA12; verbal report.

$_{68}Er$ Resonances Er(n) E_n = 0.07 to ~30 ev

E_o(ev)	$\sigma_o\Gamma^2$	cryst
0.47 *1*	10-50	
0.58 *1*	10-50	
6.10 *6*	50-100	
9.62 *9*	10-50	
16.2 *2*	10-50	
21.2 *3*		
27.5 *4*		

V.L.Sailor, H.H.Landon, H.L.Foote, Jr., Phys. Rev. 96, 1014 (1954); 90, 362A (1953).

$_{68}Er^{160}_{92}$ $_{29^h}$

τ		29^h	Ta^{181}(340-Mev p)	chem
No γ				
p 5.0^{h}Ho	chem	Not p 22^{m}Ho		chem

W.E.Nervik, G.T.Seaborg, Phys. Rev. 97, 1092 (1955).

$_{68}Er^{161}_{93}$ $_{3.1^h}$

τ		3.1^h	Ta^{181}(340-Mev p)	chem
β^+		1.2		s

W.E.Nervik, G.T.Seaborg, Phys. Rev. 97, 1092 (1955).

$_{69}Tm^{166}_{97}$ $_{7.7^h}$

γ		0.080	0.67	scin
		0.112	0.80	
		0.140	1.32	
		0.180		

γ's observed with 54^{h}Yb source but assumed to belong to Tm^{166}

W.E.Nervik, G.T.Seaborg, Phys. Rev. 97, 1092 (1955).

$_{69}Tm^{167}_{98}$ $_{9.6^d}$

τ			9.6^d	Ta^{181}(340-Mev p)		chem
γ	100†	0.049	9†	0.515		scin
	2†	0.115	18†	0.720		
	29†	0.202				

W.E.Nervik, G.T.Seaborg, Phys. Rev. 97, 1092 (1955).

$_{69}Tm^{169}_{100}$ stable

J	1/2	S
μ	-0.20 *3*	

Shell model predicts even parity but μ agrees with $p_{1/2}$ Schmidt limit

K.H.Lindenberger, A.Steudel, Naturwiss. 42, 41 (1955).

$_{69}Tm^{170}_{101}$ $_{127^d}$ Tm^{169}(pile n,γ) chem

γ	2.6%	0.0841 *3*	α_K = 1.6	cryst
x	3.7%	K x ray		4π pc
No ϵ_K	(<0.2%)	(Er K x ray <0.2%)		

M.Jaffe, UCRL-2537 (1954).

$_{70}Yb$ Resonances Yb(n) E_n = 0.07 to 20 ev

E_o(ev)	$\sigma_o\Gamma^2$**	cryst
0.597 *1**	1.28 ± 0.10	
4.551 *3*	< 1	
8.09 *8*	1-10	
13.30 *14*	1-10	
18.2 *2*	1-10	

*Assigned to A = 169 **For natural Yb

V.L.Sailor, H.H.Landon, H.L.Foote, Jr., Phys. Rev. 96, 1014 (1954); 89, 904A (1953).

$_{70}Yb^{166}_{96}$ $_{54^h}$

τ		53.8^h	Ta^{181}(340-Mev p)	chem
			p 7.7^{h}Tm	chem
γ		0.112*		scin
		0.140*		

*Possibly in 7.7^{h}Tm

W.E.Nervik, G.T.Seaborg, Phys. Rev. 97, 1092 (1955).

$_{70}Yb^{167m}_{97}$ $_{74^m}$

τ		74^m	Ta^{181}(340-Mev p)	chem
β^+		2.4 *2*		s

W.E.Nervik, G.T.Seaborg, Phys. Rev. 97, 1092 (1955).

$_{70}Yb^{169}_{99}$ $_{31.8^d}$ Resonance Yb(168)(n) E_n = 0.07 to 20 ev

E_o(ev)	$\sigma_o\Gamma^2$	cryst
0.597 *1*	995 ± 90	

See also Yb

V.L.Sailor, H.H.Landon, H.L.Foote, Jr., Phys. Rev. 96, 1014 (1954); 89, 904A (1953).

$_{70}Yb^{175}_{105}$ $_{4.2^d}$ $Yb^{(174)}$(th n,γ)

β^-	7%	0.072	scin/γ,sl
	3%	0.355	
	90%	0.468	
γ		0.1136	M1 + E2 sl ce,scin
		0.1376	
		0.144	
		0.251	
		0.2824	E1 + M2
		0.3960	M2 + (E1?)

(0.072 β)(0.396 γ) (0.355 β)(0.113 γ)
(0.113 γ)(0.282 γ) (0.144 γ)(0.251 γ)

J.P.Wize, M.E.Bunker, J.W.Starner, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), YA3(1955); verbal report.

Lu 71

Resonances Lu(n) E_n = 0.07 to ~21 ev cryst

E_o(ev)		$\sigma_o\Gamma^{2*}$	Isotope
0.142	1	1.4 ± 0.3	177
1.57	1	< 1	177
2.62	2	1-10	177
4.80	4	1-10	177 ?
5.30	5	10-50	176
11.4	2	10-50	176
14.4	3		176
20.6	5		176 ?

*For natural Lu

V.L.Sailor, H.H.Landon, H.L.Foote, Jr., Phys. Rev. 96, 1014 (1954); 92, 656 (1953); 90, 362A (1953).

Lu^{176} 71 105 2.4×10^{10}y

Resonances $Lu^{(175)}$(n) E_n = 0.07 to ~21 ev cryst

E_o(ev)		$\sigma_o\Gamma^2$
5.30	5	10-50
11.4	2	10-50
14.4	3	
20.6*	5	

*Assignment uncertain

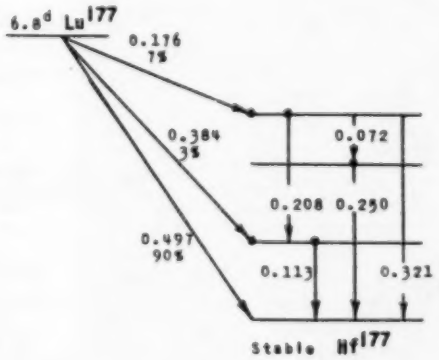
V.L.Sailor, H.H.Landon, H.L.Foote, Jr., Phys. Rev. 96, 1014 (1954); 92, 656 (1953); 90, 362A (1953).

Lu^{177} 71 106 6.8d

$Lu^{(176)}$(pile n,γ)

β^-	7%	0.176		sl $\beta\gamma$
	3%	0.384		sl $\beta\gamma$
	90%	0.497 2		sl
γ	2†	0.07164 2	α ~0	E1 cryst
	100†	0.11297 2	α_K = 0.75	E2
		α_{L_1} = 0.12; α_{L_2} = 0.70; α_{L_3} = 0.58		
	220†	0.20836 2	α_K = 0.044	
			α_{L_1} = 0.007	E1
	3†	0.2500 5	α_K = 0.3 α_{L_1} = 0.1	
	3†	0.3213 1	α_K = 0.2	

(0.072γ)(0.250γ)



P.Marmier, F.Boehm, Phys. Rev. 97, 103(1955).

Lu^{177} 71 106 6.8d

Resonances $Lu^{(176)}$(n) E_n = 0.07 to ~21 ev cryst

E_o(ev)	$\sigma_o\Gamma^2$
0.142 1	54 ± 12
1.57 1	10-50
2.62 2	> 100
4.80* 4	> 100

*Assignment uncertain

V.L.Sailor, H.H.Landon, H.L.Foote, Jr., Phys. Rev. 96, 1014 (1954); 92, 656 (1953); 90, 362A (1953).

Hf^{175} 72 103 70d

γ	0.0893		sl ce,scin
	0.1136		
	0.2293		
	0.3186		
	0.3429		
	0.4322		

(0.089γ)(0.343γ)

J.P.Mize, M.E.Bunker, J.W.Starner, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), YA3(1955); verbal report.

Hf^{176} 72 104 stable

Level $Hf^{176}(\alpha,\alpha'\gamma)$ E_α = 5.7

γ	0.087 3	ϵB(E2) = 0.56		scin

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), X6; verbal report.

Hf^{177} 72 105 stable

Levels $Hf^{177}(\alpha,\alpha'\gamma)$ E_α = 5.7

γ	0.113 2	ϵB(E2) = 0.77		scin
	0.250 5	= 0.47		

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), X6; verbal report.

Hf^{178} 72 106 stable

Level $Hf^{178}(\alpha,\alpha'\gamma)$ E_α = 5.7

γ	(0.090)	ϵB(E2) = 0.65		scin

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 98, (1955).
BAPS 30, #1 (New York), X6; verbal report.

Hf^{179} 72 107 stable

Levels $Hf^{179}(\alpha,\alpha'\gamma)$ E_α = 5.7

γ	0.119 2	ϵB(E2) = 0.67		scin
	0.260 5	= 0.05		

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 98, (1955).
BAPS 30, #1 (New York), X6; verbal report.

Hf^{180} 72 108 stable

Level — $Hf^{180}(\alpha,\alpha'\gamma)$ $E_\alpha = 5.7$

γ (0.093) $\epsilon B(E2) = 0.78$ scin

N.P.Heydenburg, G.M.Temmer, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), X6; verbal report.

Ta 73

Abundances ms

Ta^{180} 0.0123%

Ta^{181} 99.988%

No Ta^{177}, Ta^{178}, Ta^{179} ($< 0.0003\%$)

No Ta^{182}, Ta^{183} ($< 0.0002\%$)

F.A.White, T.L.Collins, Jr., F.M.Rourke, Phys. Rev. 97, 566 (1955).

Ta^{181} 73 108 stable

Level — $Ta^{181}(\alpha,\alpha'\gamma)$ $E_\alpha = 3.65$

γ 0.137 K/L~8 sm ce

93% M1, 7% E2

E.W.Bernstein, H.W.Lewis, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), CA7(1955); verbal report.

γ — $Ta^{181}(n,?\gamma)$ $E_n = 3.2$ scin

1.26†	0.46
0.93†	1.4

†σ in barns

V.E.Scherrer, B.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

Resonance $Ta^{(180)}(n)$ $E_n = 0.35$ to 0.53 ev

0.433 ev $\sigma_o = 12{,}900^*$ cryst

$\Gamma = 0.030$

*Using 0.0123% for abundance

J.E.Evans, E.G.Joki, R.R.Smith, Phys. Rev. 97, 565 (1955).

Ta^{182} 73 109 111d

τ 115.5d

γ

		sd ce,pe
0.0657 2		0.9295 10
0.0677 2		0.9594 18
0.0847 3		1.0015 18
0.1001 3		1.0459 10
0.1098 5		1.0459 10
0.1135 2	100*	1.1220 10
0.1162 5		1.1591 10
0.1516 10	80*	1.1893 18
0.1794 10	80*	1.2220 10
0.1976 10	9*	1.2303 12
0.2221 5	5*	1.2575 20
0.2290 5	2*	1.2745 10
0.2638 10	10*	1.2894 20
0.2962 10		1.3310 20
0.3295 10		1.3725 20
0.3352 8		1.4536 11
0.8934 13		1.6085 15

*Relative intensity ce_K

C.W.Fowler, M.W.Kruse, V.Keshishian, R.J.Klotz, G.P.Waller, Phys. Rev. 94, 1062 (1954); priv. comm.

Ta^{182} 73 109 111d

β^- 0.51 1 — Ta^{181}(pile n,γ); sl

Evidence for at least 2 lower energy β's

γ			α_K	α_{L_1} (sl ce, cryst)	α_{L_2} (sl ce, cryst)	α_{L_1}
(E1)	w	0.03336				
(E1)	w	0.04271				
M1	8†	0.06571*		2.8	0.4	0.23
E1	85†	0.06774*		0.17	0.07	0.07
M1	5†	0.08467*		1.8	0.6	0.5
E2	40†	0.10009*	1.5	0.13	1.45	1.35
M1	8†	0.11366	1.7	0.4	0.07	
	1.7†	0.11640				
E1	36†	0.15241	0.07			
(E1)	12†	0.15637	small			
	16†	0.17936	0.41	0.17		0.05
E2	7.5†	0.19831	0.24		0.11	0.07
E1	35†	0.22205	0.06	0.01		
E2	20†	0.22927	0.16		0.05	0.03
E2	22†	0.26409	0.11		0.04	0.02
(E3)		0.927				
(E3)		0.960		K/L		
(M1 + E2)		1.003		7.0		
M1 + E2	100†	1.122	0.005	6.7		M1 + E2
(M2)	6.5†	1.155	0.004			
M2 + E3	45†	1.189	0.006	6.5		
E2	95†	1.222	0.003	6.0		
E2	50†	1.231	0.003			
(M2)		1.289		6.6		
(E3)		1.375				
		1.437				
(M2 + E3)		1.454				

*M and N conversion data given

Decay scheme proposed

α's based on α_K (Ta^{183} 0.24605 γ) = 0.38

J.J.Murray, F.Boehm, P.Marmier, J.W.M.DuMond, Phys. Rev. 97, 1007 (1955); 95, 864 (1954).

Resonances $Ta^{181}(n)$ $E_n \leq 130$ ev

E_o (ev)		
10.38	Γ=0.053 ev	Γ_γ=0.049 ev

chopper

20 resonances observed up to 130 ev

10 resonances up to 40 ev give $\bar{D}$ = 9 ev

V.E.Pilcher, D.J.Hughes, J.A.Harvey, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), B8 (1955); verbal report.

Resonances $Ta^{181}(n)$ E_n = 13 to 147 ev

E_o (ev)	
22.9	chopper, cryst
35	
36	

F.B.Simpson, R.G.Fluharty, O.D.Simpson, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), B5 (1955); verbal report.

Ta^{183} 73 110 5d

τ 5.2d — Ta^{181}(pile n)

β^- >95% 0.615 10 sl

<5% <1.0

γ			α_K	α_{L_1} (sl ce, cryst)	α_{L_2} (sl ce, cryst)	α_{L_3} (sl ce, cryst)
M1	22†	0.04097		11.5		0.8
M1	220†	0.04648*		7.4	1.05	0.5
M1	240†	0.05259*		3.8	0.9	0.55

(CONTINUED)

Ta^{183} 73 110 5^d

γ			α_K	α_{L_1}	α_{L_2}	α_{L_3}
KM1)	11†	0.08292		1.4		
M1	70†	0.08470*		1.1		
E2	220†	0.09907*	1.4		1.55	1.45
M1	9.5‡	0.10194	5.4			
M2	4†	**0.10249	3.5	6.0		
(E2)	3†	0.10314				
M1	350†	0.10793*	3.8	0.6		
(M1)	17†	0.10973				
M1	3†	0.12038	2.1			
M1	15†	**0.14225		0.35		
M1	85†	0.14412*	1.65	0.30		
E2	105†	0.16053	0.4			
M1	310†	0.16136	1.15			
M1	165†	0.16233	1.10			
M1	9†	0.19264	0.65			
M1	9†	0.20327	0.65			
M1	35†	0.20506	0.6	0.13		
M1	26†	0.20881	0.7			
E2	165†	0.20987	0.22		0.065	0.03
E2	340†	0.24426	0.15			
M1	1000†	0.24605	(0.38)	0.07		
E2	200†	0.29171	0.07		0.023	
M1	300†	0.31303	0.22	0.035		
M1	400†	0.3540	0.14	0.025		
(M1)	35†	0.3656				
(E2)	40†	0.4066				

*H and N conversion data given

**Not assigned in proposed decay scheme

α's based on α_K (0.24605 γ) = 0.38

J.J.Murray, F.Boehm, P.Marmier, J.W.M.DuMond, Phys. Rev. 97, 1007 (1955); 92, 202; 96, 858A (1954).

W 74

Abundances

W^{185}	< 0.0002%	ms
W^{187}	< 0.0001%	

F.A.White, T.L.Collins, F.M.Rourke, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), H4.

		W(n,n'γ)	E_n = 4.4
γ	59†	0.64 *2*	
	100†	0.77 *2*	

R.M.Sinclair, Phys. Rev. 99(1955); BAPS 30, #3(Washington), F7(1955); verbal report.

W^{182} 74 108 stable

Level		$W^{(182)}(\alpha,\alpha'\gamma)$	E_α = 2.75	
γ	0.106	K/L < 1	E2	sm ce

E.M.Bernstein, M.W.Lewis, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), CA7(1955); verbal report.

W^{184} 74 110 stable

Level		$W^{(184)}(\alpha,\alpha'\gamma)$	E_α = 2.75	
γ	0.116	K/L < 1	E2	sm ce

E.M.Bernstein, M.W.Lewis, Phys. Rev. 99(1955); BAPS 30, #3(Washington), CA7(1955); verbal report.

W^{186} 74 112 stable

Level		$W^{(186)}(\alpha,\alpha'\gamma)$	E_α = 2.75	
γ	0.126	K/L < 1	E2*	sm ce

E.M.Bernstein, M.W.Lewis, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), CA7(1955); *verbal report.

Re 75

Resonances Re(n) E_n = 1 to 14 ev

E_o (ev)	Γ_γ (10^{-3}ev)	σ_t	
2.157	48	13700	cryst
4.4	45		
~5.9			
~7.2			
~11.3			
11.9			

G.Igo, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), B2(1955); verbal report.

Re^{180} 75 105 2.4^m

τ	2.42^m *7*	W(31-Mev p)	
β^+	1.1 *1*	a	
γ	0.106 *10*	scin	
	0.880 *40*		

V.K.Fischer, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), YA10 (1955).

Re^{185} 75 110 stable

J	5/2	Mic
$Q(Re^{185})/Q(Re^{187}) = 1.07 \pm 0.05$		

A.Javan, A.Engelbrecht, Phys. Rev. 96, 649 (1954); 91, 222A (1953).

Re^{187} 75 112 ?

τ	> 10^{16}y	pc

No β with $E_\beta > 0.001$

L x rays observed from Re, Os, Pt, W believed produced by background γ's

D.Dixon, A.McNair, Phil. Mag. 45, 1099(1954).

J	5/2	Mic
$Q(Re^{185})/Q(Re^{187}) = 1.07 \pm 0.05$		

A.Javan, A.Engelbrecht, Phys. Rev. 96, 649 (1954); 91, 222A (1953).

Re^{188} 75 113 16.9^h

τ_2	16.7^h *5*	$W^{(186)}$(slow n)	chem
β^-	2.0i		s

B.S.Dzhelepov, N.D.Novosil'tseva, P.A.Tishkin, Izvest. Akad. Nauk Ser. Fiz. SSSR 18,76(1954).

$_{76}Os^{187}$ stable

τ_e $>10^{15}$y pc

L x rays observed from Re, Os, Pt, W believed produced by background γ's

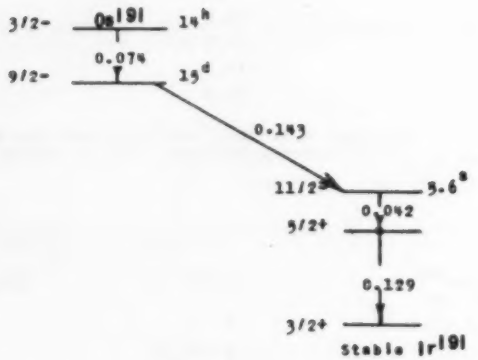
D.Dixon, A.McNair, Phil. Mag. 45, 1099 (1954).

$_{76}Os^{191}$ 15^h

γ 0.0742 E4 1-2% M5~98%

$L_1 : L_2 : L_3 = 55 : 15 : 100$

No β^- (<5%)



J.W.Mihelich, M.Goldhaber, Phys. Rev. 98 (1955).
BAPS 30, #1(New York), S1; verbal report.

$_{77}Ir$ Resonances Ir(n) E_n = 0.1 to 10 ev

E_o(ev)	$\Gamma_\gamma(10^{-3}$ev)	A*
0.654	74 ±5	192
1.305	87 ±3	194
5.36	65 ±5	?

*Assignment from activation

H.H.Landon, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), B1(1955); verbal report.

$_{77}Ir^{191}$ 4.9^s

τ_1 4.91^s *14* Ir(31-Mev p)

V.K.Fischer, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), YA10(1955).

τ_1 5.8^s *4* 4 15^dOs chem

γ (0.042)

(0.129)

R.A.Naumann, J.B.Gebhart, Phys. Rev. 96, 1452 (1954).

τ_1 5.8^s *1* Ir^{191}(fast n,n'γ)

γ (0.042)

(0.129) $\tau < 5\times10^{-10}s^*$ scin

J.W.Mihelich, M.McKeown, M.Goldhaber, Phys. Rev. 96, 1490(1954); *A.W.Sunyar, ibid.

$_{77}Ir^{192}$ 74.4^d

τ_1 1.42^m $Ir^{(191)}$(pile n,γ)

γ 0.0580 *4* $L_2/L_3 = 1.1$ 87 ce

$\alpha_1 \gtrsim 870$ E3 scin

No $\gamma\gamma$ (< 1% of count expected for 2 quantum decay)

Continuum ≤ 50 kev attributed to bremsstrahlung (< 0.01 quantum/ce)

J.P.Wize, M.E.Bunker, J.W.Starner, Phys. Rev. 96, 444; 95, 627A (1954).

β^- 0.672 $Ir^{(191)}$(pile n,γ) sl

γ	2.6†	0.1362 *3*	57†	0.4678 *1*	sl pe
	0.8†	0.1740 *4*	5.2†	0.4844 *2*	
	0.8†	0.2012 *3*	6.4†	0.5887 *3*	
	3.5†	0.2054 *2*	10†	0.6045 *3*	
	1.0†	0.2815 *5*	7.7†	0.6127 *2*	
	26†	0.2958 *1*	0.06†	0.745 *3*	
	28†	0.3084 *1*	0.06†	0.783 *2*	
	77†	0.3165 *1*	0.9†	0.8854 *10*	
	0.5†	0.374 *2*	0.15†	1.065 *2*	
	0.5†	0.440 *2*	0.08†	1.157 *2*	

M.W.Johns, S.V.Nablo, Phys. Rev. 96,1599(1954)

γ	137†	0.31	(3 unresolved γ's) scin
	49†	0.47	(2 unresolved γ's)
	27†	0.60	(3 unresolved γ's)
x	13†	K x ray	

†Photons per 100 β^-

H.Jaffe, UCRL-2537 (1954).

$_{77}Ir^{194}$ 19^h

β^- ~8% 0.430 $Ir^{(193)}$(pile n,γ) sl

9.7% 0.975

15% 1.905

68% 2.236 *10*

γ	5.1†	0.2930 *3*	0.3†	1.339 *2*	sl pe
	27†	0.3281 *2*	0.8†	1.466 *1*	
	<3†	0.466	0.2†	1.478 *1*	
	1.7†	0.6200 *10*	0.3†	1.507 *2*	
	6.2†	0.6433 *6*	0.3†	1.618 *2*	
	2.9†	0.9374 *4*	0.2†	1.662 *3*	
	2.9†	1.1492 *6*	0.3†	1.802 *2*	
	1.7†	1.180 *1*	0.05†	2.048 *4*	
	0.4†	1.216 *1*			

M.W.Johns, S.V.Nablo, Phys. Rev. 96, 1599 (1954).

$_{78}Pt$ Level Pt(p,p'γ) E_p = 2.0 to 4.0

γ 0.345 scin

Anisotropy in σ_γ (E_p) studied

W.I.Goldburg, Phys. Rev. 99(1955); BAPS 30,#3 (Washington), CA8(1955).

Pt^{193} 78 115 3.4^d

τ_1		3.5^d 4	source:	12^{h}Hg
γ		0.1345		sm ce

K : L_1 : L_3 : M = 1 : 2 : 4 : 1

d 3.8^{s}Au 0.03%

J.Brunner, H.Guhl, J.Halter, O.Huber, Helv. Phys. Acta 28, 85 (1955).

Pt^{196} 78 118 stable

Resonances Pt^{195}(n) chopper

E_o (ev)	Γ(ev)
11.9	0.17
19.5	0.12
68.0	
120	
153	

A.Stolovy, J.A.Harvey, Phys. Rev. 99(1955); BAPS 30, #3(Washington), B9(1955); priv.comm.

Pt^{197} 78 119 18^h

β^-		0.468		scin $\beta\gamma$
		0.479		
		0.670		
γ	30+	0.077		scin
	3.8+	0.191		
	1.0+	0.279		

(0.077 γ)(0.191 γ)

V.R.Potnis, C.E.Mandeville, J.S.Burlew, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), VA6 (1955); verbal report.

$Pt^{199?}$ 78 121 29^m

Resonance $Pt^{(198?)}$(n) chopper

E_o (ev)
96.0

A.Stolovy, J.A.Harvey, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), B9(1955); priv. comm.

Au^{192} 79 113 4.8^h

τ		4.8^h	Au^{197}(p) Hg(p)	chem
γ		0.1365	0.401	s ce
		0.1577	0.4155	
		0.1738	0.4355	
		0.2054	0.467	
		0.2818	0.588	
		0.2957	0.612	
		0.3081	0.783	
		0.3160	1.158	

G.T.Ewan, A.L.Thompson, Proc. Roy. Soc. Canada 47, 126A (1953); and quoted by W.W.Johns, S.V.Nablo, Phys. Rev. 96, 1599 (1954).

Au^{193} 79 114 3.9^s

τ_1		3.9^s 3	Pt(31-Mev p)	
γ		0.26 2	α_K = 0.4*	a, scin

V.K.Fischer, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), YA10(1955); *verbal report.

Au^{193} 79 114 3.9^s

τ_1			3.8^s 3	source:	12^{h}Hg
γ	99.5%		0.0324	E3	sl ce
	99.5%		0.2573	M1 (+E2)	
	0.5%		0.2898	M4	

(ce 0.032 γ)(0.257 γ) sl

p 3.4^{d}Pt 0.03%

J.Brunner, H.Guhl, J.Halter, O.Huber, Helv. Phys. Acta 28, 85 (1955).

Au^{195} 79 116 185^d

$Pt^{(196)}$ (28-Mev d,3n) chem

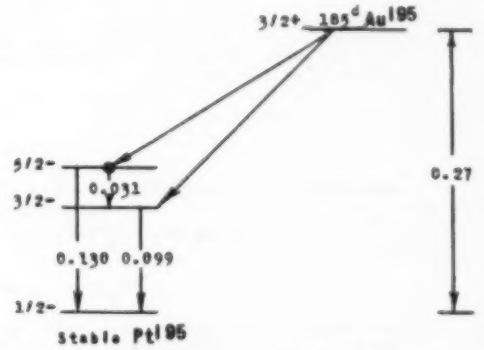
γ	1.4+	(0.031)	α = 32	M1	pc
	14+	(0.099)			
x	41+	L x ray			
	100+	K x ray			

(L x ray)(L x ray, 0.031 γ)

ϵ_L/ϵ_K (to 0.130 level) = 0.58 ± 0.14

E_{dis} = 0.14 + 0.13 (E_γ)

Data indicate little if any ϵ to Pt^{195} g.s.



A.Bisi, L.Zappa, Nuovo Cim. 12, 539 (1954).

Au^{197} 79 118 stable

Levels Au^{197}(p,p'γ) E_p = 3.50

Au^{197}(α,$\alpha'\gamma$) E_α = 2.3 to 3.5

γ	0.077		sm ce
	0.191		
	0.279	K/L = 5.7	
		64% M1, 36% E2	

Direct excitation of 0.077 level established

E.M.Bernstein, M.W.Lewis, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), CA7(1955); verbal report.

Levels Au^{197}(p,p'γ) E_p = 2.0 to 5.0

0.279 Level J = 5/2+ p,$\gamma(\theta)$

γ 0.279 E2/M1 ~ 0.7

0.555 Level J = 7/2+ p,$\gamma(\theta)$

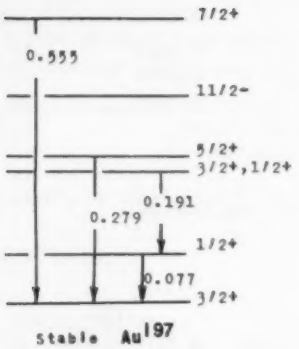
γ 0.555

No 0.276 γ (< 5% of 0.555 γ) from no(0.279γ)γ

No 0.478 γ

(CONTINUED)

Au^{197} 79 118 stable



C.F.Cook, C.M.Class, J.T.Eisinger, Phys. Rev. 94, 744, 747A; 95, 628A; 96, 658 (1954).

Au^{198} 79 119 2.70^d

J 2 M

μ probably positive*

J.B.Reynolds, R.L.Christensen, D.R.Hamilton, A.Lemonick, F.W.Pipkin, H.M.Stroke, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), BA7 (1955); *verbal report.

Resonance $Au^{197}(n)$ E_n = 1 to 14 ev

(4.94 ev) $\sigma_s\Gamma^2$ = 75.4 cryst

σ_s/σ_t = 0.106

H.L.Foote, Jr., J.Moore, Phys. Rev. 98 (1955). BAPS 30, #1(New York), HA1.

Au^{199} 79 120 3.16^d

J 3/2 M

J.B.Reynolds, R.L.Christensen, D.R.Hamilton, A.Lemonick, F.W.Pipkin, H.M.Stroke, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), BA7(1955).

Hg 80

γ st Hg(n,?γ) 0.38 0.54 0.90 E_n = 3.2 1.21 2.0 scin

V.E.Scherrer, B.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

Hg^{193} 80 113

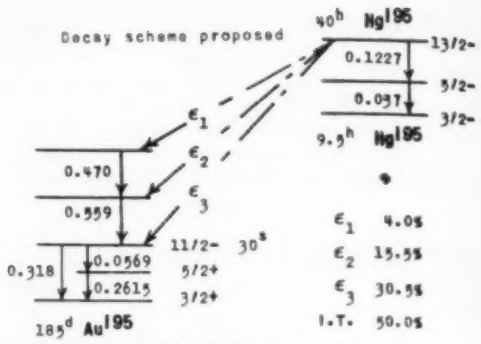
source 12^hHg

γ 0.570 0.860 0.920 sl ce

J.Brunner, M.Ghul, J.Halter, O.Huber, Helv. Phys. Acta 28, 85 (1955).

Hg^{195} 80 115 40^h

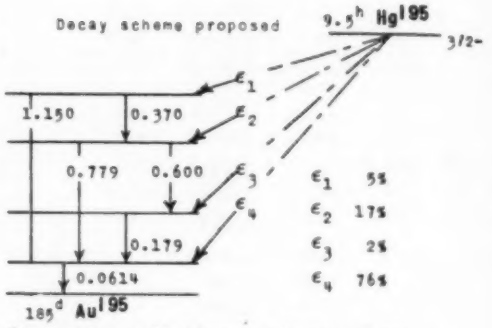
Decay scheme proposed



Supporting coincidence data not given

Hg^{195} 80 115 9.5^h

Decay scheme proposed



Supporting coincidence data not given

J.Brunner, J.Halter, O.Huber, R.Joly, D.Maeder, Helv. Phys. Acta 27, 512A, 572 (1954).

Hg^{197} 80 117 23^h

(ce 0.165 γ)(0.134 γ) delay 8×10^{-9}s

(ce$_{K,L,M}$ 0.165 γ)(0.134 γ)(θ) suggests 0.134 γ is E2 and 0.165 γ is M4 + E5 sl ce,scin

H.H.Coburn, S.Frankel, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), YA7(1955); verbal report.

Hg^{197} 80 117 65^h

J 1/2 Au^{197}(15-Mev d,2n) chem

μ 0.52 *I* S

$\mu(65^h Hg^{197})/\mu(Hg^{199})$ = 1.033 ± 0.016

F.Bitter, S.P.Davis, B.Richter, J.E.R.Young, Phys. Rev. 96, 1531 (1954).

Hg^{198} 80 118 stable

Level $Hg^{(198)}$ (0.411) (γ,γ) J = 2 Au^{198} at 1125°C $\gamma\gamma(\theta)$

F.R.Metzger, Phys. Rev. 97, 1258 (1955).

Hg^{199} 80 119 44^m

τ_1 42^m *I* Hg(fast n)

γ 0.159 α_K = 0.34 scin

0.368 $\alpha_K \sim 1$

(x ray)(0.159 γ, 0.368 γ)

(0.159 γ)(0.368 γ)(θ) $\eta(\pi) < 0$

M.M.Bolotin, R.G.Wilkinson, Phys. Rev. 99 (1955); BAPS 30, #3 (Washington), YA8(1955); verbal report.

$Hg^{203}_{80\ 123}$ 47^d

γ (0.280) $\alpha_K = 0.147$ $\alpha_L = 0.045$ $s\pi$,scin $\beta(ce)/\beta$ x/γ

α_K, α_L gives E2/M1 = 3.0

R.K.Doerner, A.H.Weber, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), YA11(1955).

$Tl^{196}_{81\ 115}$ $\sim 4^h$

τ $\sim 4^h$ Tl(190-Mev p) chem

ϵ

γ 0.426 sd ce

G.Andersson, E.Arbman, I.Bergström, A.H.Wapstra, Phil. Mag. 46, 70 (1955).

$Tl^{197}_{81\ 116}$ 2.8^h

τ_2 2.8^h ↓ Tl(190-Mev p) chem; ms

ϵ

γ	>3*	0.134	K/L ≥ 0.1	$L_1L_2/L_3 = 1.4$
	>100*	0.152	K/L > 2.5	No L_3
	>5*	0.174	K/L ~ 5	No L_3
	5*	0.269?		
	7*	0.434	K/L ~ 8	
	8*	0.583?		
	1*	0.588?		
	4*	0.611		
	3*	0.637?		

Energy range observed 0.05 to 0.70

*Relative intensity ce_K

G.Andersson, E.Arbman, I.Bergström, A.H.Wapstra, Phil. Mag. 46, 70 (1955).

$Tl^{200}_{81\ 119}$ 27^h

γ	5*	0.1163		sd ce
	4*	0.2521		
	2*	0.2891	?	
	100*	0.3676	K/L = 2.0	
	7*	0.5788	K/L = 4	
	1*	0.6284	?	
	1*	0.6602	?	
	1*	0.7884	K/L = 5	
	8*	0.828	K/L = 4	
	9*	1.205	K/L = 4.3	
	1*	1.224		
	1*	1.363		
	1*	1.515	*Relative intensity ce_K	

K.E.Bergkvist, I.Bergström, C.J.Herrlander, S.Hultberg, H.Slätis, E.Sokolowski, A.H.Wapstra, T.Wiedling, Phil. Mag. 46, 65, (1955).

$Tl^{201}_{81\ 120}$ 3^d

		L_1/L_2	K/L	sd ce
γ	0.0306	10		M1
	0.0321	10		M1
60*	0.1350	10	7.0	M1
100*	0.1672	10	8.2	M1

(0.135 γ)(ce 0.030 γ, ce 0.032 γ) sl

No (0.167 γ)(ce 0.030 γ, ce 0.032 γ) sl

No (0.135 γ)(0.167 γ) No 0.1657 γ

(0.030 γ)/(0.032 γ) = 1.0

(0.167 γ)/(0.135 γ) = 3.2

*Relative intensity ce_K d 9.4^hPb

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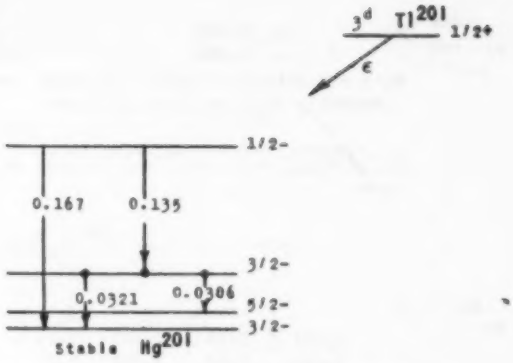
$Tl^{201}_{81\ 120}$ 3^d



K.E.Bergkvist, I.Bergström, C.J.Herrlander, S.Hultberg, H.Slätis, E.Sokolowski, A.H.Wapstra, T.Wiedling, Phil. Mag. 46, 65 (1955).

$Tl^{202}_{81\ 121}$ 12^d

d $\sim 3\times10^{5}$?Pb chem

$\epsilon_K/\epsilon_L \sim 2.3$ from K x ray/ L x ray = 2.6 scin

J.R.Huizenga, C.M.Stevens, Phys. Rev. 96, 548 (1954).

$Tl^{203}_{81\ 122}$ stable

$Tl^{(203)}(p,p'\gamma)$ $E_p = 4.0$

γ 0.279 $\tau_\gamma(E2) = 3.3\times10^{-10}s^p$ scin

0.410 $= 1.1\times10^{-12}s$

(0.279 γ)(0.410 γ)

P.H.Stelson, F.K.McGowan, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), CA5(1955); verbal report.

$Tl^{204}_{81\ 123}$ 4.1^y

β^- 0.762 5 sl

Includes correction of -0.003 for 3% resolution

L.Feuvrais, T.Yuasa, Compt. rend. 239, 1627 (1954).

ϵ_K 1.8% 4π pc, scin

ϵ_L 0.6%

Hg K_α x ray cryst

M.Jaffe, UCRL-2537 (1954).

Resonance $Tl^{203}(n)$ chopper

E_o(ev)	Γ(ev)	J
238	~5	1

A.Stolovy, J.A.Harvey, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), B9(1955); priv. comm.

$Tl^{205}_{81\ 124}$ stable

γ $Tl^{(205)}(p,p'\gamma)$ $E_p = 4.0$

0.205 $\tau_\gamma(E2) = 2.5\times10^{-10}s^*$ scin

0.410

~0.60*

(0.205 γ)(0.410 γ)

P.H.Stelson, F.K.McGowan, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), CA5(1955); *verbal report.

Tl^{208} 81 127 3.1^m

γ	0.252		s ce
	0.763		scin, s ce

Both γ's coincident with 2.62γ and are probably from new level at 3.961

L.G.Elliott, R.L.Graham, J.Walker, J.C.Wolfson, Proc. Roy. Soc. Canada 48, 12A (1954).

Pb 82

γ Pb(n,n'γ) E_n = 3.2 scin

0.52†	0.35	0.18†	1.10
1.02†	0.52	0.25†	1.4
1.05†	0.80	0.16†	2.2

†σ in barns

V.E.Scherrer, B.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

Pb^{197} 82 115 42^m

τ 42^m 3 Tl(190-Mev p) chem ms

ϵ

γ	> 13°	0.169**		sd ce
	100°	0.223	K/L ≥ 0.4	L_1L_2/L_3 = 2.3
	67°	0.234**	K/L ~ 0.3	L_1L_2/L_3 = 2.0
	13°	0.323?		
	85°	0.386	K/L ~ 5	No L_3
	59°	0.388	K/L ~ 5	No L_3

Energy range observed 0.05 to 0.70

*Relative intensity ce_K

**Possibly converted in Pb

G.Andersson, E.Arbman, I.Bergström, A.H.Wapstra, Phil. Mag. 46, 70 (1955).

Pb^{198} 82 116 2.3^h

τ 2.3^h 2 Tl(190-Mev p) chem ms

ϵ

γ	> 60°	0.173	K/L ≥ 0.5	L_1L_2/L_3 = 1.9
	5°	0.276?		
	100°	0.291		No L_3
		0.330?		
	100°	0.365		
	17°	0.383		
	10°	0.398?		
	8°	0.420?		

No 25^m activity observed

Energy range observed 0.05 to 0.70 sd ce

*Relative intensity ce_K

G.Andersson, E.Arbman, I.Bergström, A.H.Wapstra, Phil. Mag. 46, 70 (1955).

Pb^{199} 82 117 12^m

τ_1 12.2^m 3 Tl(190-Mev p) chem ms

γ 0.423 K/L = 1.9 M4? sd ce

Photon not detected γ converted in Pb

G.Andersson, E.Arbman, I.Bergström, A.H.Wapstra, Phil. Mag. 46, 70 (1955).

Pb^{199} 82 117 90^m

τ_2 90^m 10 Tl(190-Mev p) chem ms

ϵ

γ	43°	0.354	K/L ~ 5	No L_3	sd ce
	100°	0.367	K/L ~ 5	No L_3	
	3°	0.722?			

*Relative intensity ce_K

G.Andersson, E.Arbman, I.Bergström, A.H.Wapstra, Phil. Mag. 46, 70 (1955).

Pb^{200} 82 118 22^h

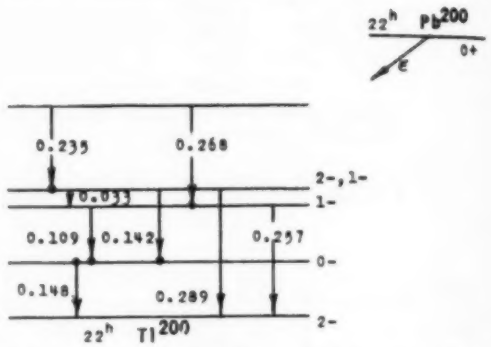
τ 21.5^h 4 Tl(190-Mev p) chem

γ 0.0328 ce_M, ce_N only sd ce

3°	0.1095	K/L	No L_3	M1
43°	0.1422	4.5	No L_3	M1
100°	0.1480	0.4	L_1L_2/L_3 = 1.9	E2
4°	0.1589			
22°	0.2353	5.5	No L_3	M1
7°	0.2573	4.5	No L_3	M1
14°	0.2680	4.5	No L_3	M1
1°	0.2895			
	0.450	*Relative intensity ce_K		

(ce 0.148γ)(ce 0.109, 0.142, 0.235, 0.268γ)**

No(ce 0.148γ)(ce 0.159, 0.257, 0.289γ)**



K.E.Bergkvist, I.Bergström, C.J.Herrlander, S.Hultberg, H.Slätis, E.Sokolowski, A.H.Wapstra, T.Wiedling, Phil. Mag. 46, 65 (1955); **T.R.Gerholm, Ibid.

Pb^{201} 82 119 60^s

τ_1 60^s Tl(31-Mev p)

γ 0.65 3 α_K ~ 0.8* a, scin

V.K.Fischer, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), YA10(1955); *verbal report.

Pb^{201} 82 119 9.4^h

τ_2 9.4^h 2 Tl(190-Mev p) chem

γ(Tl)	0.1291	K/L			K/L
0.7°	0.2844?		0.6°	0.692	6.5
0.5°	0.3100	0.7?	0.3°	0.708?	
100°	0.3303	4.7	1.0°	0.766	5.5
25°	0.3612	5.6	0.4°	0.825?	
0.6°	0.3943	2.5	1.3°	0.907	5.5
2.7°	0.4056	2.8	1.6°	0.946	6.5
1.9°	0.585	5.5	0.2°	1.099	5.5

(ce 0.330γ)(ce 0.361γ)** al

*Relative intensity ce_K

K.E.Bergkvist, I.Bergström, C.J.Herrlander, S.Hultberg, H.Slätis, E.Sokolowski, A.H.Wapstra, T.Wiedling, Phil. Mag. 46, 65 (1955); **T.R.Gerholm, Ibid.

Pb^{202} 82 120 3.5^h

			a_K	K/L	sd ce
γ(Pb)	2°	0.1294		< 0.003	E4
				L_2/L_3 = 1.7	
	35°	0.4219	0.035	2.5	E2
	3.5°	0.6576	0.006	7.5	E1
	100°	0.7869	0.080	1.35	E5
	12°	0.9612	0.006	5.9	E2
$\epsilon \sim 10\%$					
γ(Tl)	27°	0.3892	0.16		M1+E2
	5°	0.4013	0.030		E2
	14°	0.4599		1.5	E3

*Relative intensity ce_K

K.E.Bergkvist, I.Bergström, C.J.Herrlander, S.Hultberg, M.Siätis, E.Sokolowski, A.H.Wapstra, T.Wiedling, Phil. Mag. 46, 65 (1955).

Pb^{202} 82 120 ~3x10^{5y}

τ_2	~3x10^{5y}	p 12^{d}Tl	chem
	Tl$^{(203)}$(21-Mev d,3n)chem,		ms

Assumed σ(21-Mev d,3n) = 0.5
(Tl^{202} L x ray)/(Pb^{202} L x ray) = 1.6 implies $\epsilon_K \sim 40\%$ for Pb^{202}
No K x ray (< 0.5% of Tl^{202} K x ray) scin

J.R.Hulzenga, C.M.Stevens, Phys. Rev. 96,548 (1954).

$Pb^{203?}$ 82 121 6.7^h

τ_1	~10^8	d 12^{h}Bi	chem
γ	~0.5?		scin
	0.9		

I.Bergström, A.H.Wapstra, Phil. Mag. 46, 61 (1955).

τ_1	6.7^s 4	Tl(15-Mev p)	
γ	0.86 4	$a_K \sim 0.1$*	a, scin

V.K.Fischer, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), YA10(1955); *verbal report.

Pb^{204} 82 122 68^m

γ	12°	0.8993	E2		sd ce
	100°	0.9130	(E5)		

*Relative intensity ce_K

K.E.Bergkvist, I.Bergström, C.J.Herrlander, S.Hultberg, M.Siätis, E.Sokolowski, A.H.Wapstra, T.Wiedling, Phil. Mag. 46, 65 (1955).

γ	(0.375)	E2	99.5%	M3	0.5%
	(0.899)	E2	100%		
	(0.913)	E2	99%	M6	1%

(0.913γ)(0.375γ)(θ)
(0.913γ)(0.899γ)(θ) } J = 9, 4, 2, 0 scin

μ(1.274-Mev level) = 0.22 ± 0.02 $\gamma\gamma(\theta,H)$

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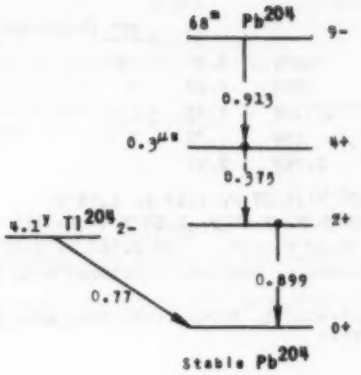
Pb^{204} 82 122 68^m



V.E.Krohn, S.Raboy, Phys. Rev. 97, 1017(1955).

Pb^{205} 82 123 ?

τ_{ϵ_K}	> 6x10^{7y}	
τ_{ϵ_L}	>> 3x10^{5y}	
	Tl$^{(205)}$(21-Mev d,2n)	chem, ms

J.R.Hulzenga, C.M.Stevens, Phys. Rev. 96, 548 (1954).

Pb^{206} 82 124 stable

Level	Pb^{206}(p,p'γ)	E_p = 4.5	scin
γ	0.803	τ_γ(E2) = 7.7x10^{-12}s	

P.M.Stelson, F.K.McGowan, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), CA5(1955); verbal report.

Pb^{207} 82 125 0.82^s

τ_1	0.799^s 13	Pb$^{(208)}$	($\leq$22-Mev γ,n)

Indirect production of 0.82^{s}Pb suggested by large threshold (10.2 ± 0.3)

W.L.Bendel, M.E.Toms, R.A.Tobin, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), YA9(1955); verbal report.

τ_1	0.8^s 1	Pb^{208}	($\leq$22-Mev γ,n)
γ	0.50		scin
	1.01		

Threshold of ~9-Mev inferred from activation ratios of Pb to Ag and Cu for $12 \leq E_\gamma \leq 23$

J.M.Reid, K.G.McNeill, Phil. Mag. 45, 957 (1954); Proc. Phys. Soc. 66A, 1179 (1953).

Pb^{207} 82 125 stable

Level	Pb$^{(207)}$(p,p'γ)	E_p = 4.5	
γ	0.570	τ_γ(E2) = 10x10^{-11}s	

P.M.Stelson, F.K.McGowan, Phys. Rev. 99(1955); BAPS 30, #3 (Washington), CA5(1955).

Pb^{208} 82 126 stable

Level	Pb$^{(207)}$(d,p)	E_d = 15.1	scin	
g.s.	l_n = 1		d,p(θ)	

N.S.Wall, Phys. Rev. 96, 670 (1954).

Bi^{207} 83 124 ~30^{d}

			xγ*	Pb(25-Mev p)	chem
γ	157†	0.57	19		scin
	100†	1.07	6		
	≤1.0†	1.46	≤1.3		
	10†	1.76	7		
	0.72†	2.47			

(0.57 γ) (1.07 γ, 1.46 γ, 1.76 γ)
No 2.05 γ, 2.20 γ, 2.33 γ (< 0.14†)
No (0.57 γ) γγ No 0.157 γ, 0.87 γ
*Percent of photons coincident with K x ray

J.R.Prescott, Proc. Phys. Soc. 67A, 540 (1954).

γ	100†	(0.570)		scin
		(0.890)		
		(1.064)		
	~0.1†*	(1.46)		
		1.77	E2,M1 or 25% E2,75% M3	

(1.77γ)(0.570γ)(θ) J = 7/2, 5/2, 1/2* or J = 9/2, 5/2, 1/2*
(1.46γ)(0.89γ)*
No 2.46γ (< 0.25†)*
ϵ_L only to 2.34 level
ϵ_K ~3% to 0.57 level

N.H.Lazar, E.D.Klema, Phys. Rev. 98 (1955). BAPS 30, #1 (New York), 53; *verbal report.

Bi^{209} 83 126 stable?

γ		$Bi^{209}(n,n'\gamma)$	E_n = 3.2	scin
	0.43†	0.49		
	1.2 †	0.94		
	0.59†	1.62		
	0.39†	2.6 ?		

†σ in barns

V.E.Scherrer, S.A.Allison, W.R.Faust, Phys. Rev. 96, 386 (1954).

Bi^{210} 83 127 5.00^{d}

J	1		S

K.F.Smith, quoted by E.A.Plassmann, L.W.Langer Phys. Rev. 96, 1593 (1954).

β^-	1.155 *5*	357

Spectrum shape can be fitted by S, T interaction with ΔJ = 1, yes

E.A.Plassmann, L.W.Langer, Phys. Rev. 96, 1593 (1954).

β^-	1.17	sl

No γ (< 0.01%)
Spectrum shape can be fitted by S, T interaction with ΔJ = 1, yes

L.Lidofsky, N.Sanzari, F.Mackiln, C.S.Wu, Phys. Rev. 98 (1955). BAPS 30, #1 (New York), 54.

Bi^{210} 83 127 2.6x10^{6}y

Level		$Bi^{209}(d,p)$	E_d = 15.1	scin

d,p(θ) for proton group with Q = 1.94 not in agreement with simple theory for l_n = 2,4,6

N.S.Wall, Phys. Rev. 96, 670 (1954).

Bi^{212} 83 129 60.5^{m}

γ		(0.040)	α = 20*	M1	αγ/α

(6.05 α)(0.040 γ)(θ) J = 1 or 2, 4, 5
*Using (6.05 α)/α = 0.70

J.W.Weale, Proc. Phys. Soc. 68A, 35 (1955).

(> 0.65 γ)(≤ 1.50 γ)		scin
(> 0.80 γ)(≤ 1.35 γ)		

F.Demichelis, Nuovo Cim. 12, 407 (1954).

Bi^{214} 83 131 19.7^{m}

(0.61 γ)(1.12 γ) most intense cascade		scin
Weak γγ for both γ's with $1.8 > E_\gamma > 0.61$		
All other γγ include 0.61 γ		
No (0.61 γ)(γ) for $E_\gamma > 1.6$		
~65% of all γ's belong to a cascade		

F.Demichelis, R.Malvano, Nuovo Cim. 12, 358 (1954).

$Po^{197?}$ 84 113

τ		~8^{m}	Bi^{209}(170-Mev p)	chem
α		6.040		S

S.Rosenblum, H.Tyrén, Compt. rend. 239,1205 (1954).

$Po^{198?}$ 84 114

τ		~6^{m}	Bi^{209}(170-Mev p)	chem
α		5.935		S

S.Rosenblum, H.Tyrén, Compt. rend. 239, 1205 (1954).

$Po^{199?}$ 84 115

τ		~11^{m}	Bi^{209}(170-Mev p)	chem
α		5.846		S

S.Rosenblum, H.Tyrén, Compt. rend. 239, 1205 (1954).

$Po^{200?}$ 84 116

τ		~8^{m}	Bi^{209}(170-Mev p)	chem
α		5.770		S

S.Rosenblum, H.Tyrén, Compt. rend. 239, 1205 (1954).

Po^{201} 84 117 18^{m}

τ		~17^{m}	Bi^{209}(170-Mev p)	chem
α		5.671		S

S.Rosenblum, H.Tyrén, Compt. rend. 239, 1205 (1954).

Po^{202} 84 118 56^{m}

τ		~55^{m}	Bi^{209}(170-Mev p)	chem
α		5.575		S

S.Rosenblum, H.Tyrén, Compt. rend. 239, 1205 (1954).

Po^{204} 84 120 3.8^h

τ		~3.8^h	Bi^{209}(170-Mev p)	chem
α		5.370		s

S.Rosenblum, M.Tyrén, Compt. rend. 239, 1205 (1954).

Po^{208} 84 124 2.9^y

α	~0.1%	4.784	s
	~100%	(5.109)	

S.Rosenblum, M.Tyrén, Compt. rend. 239, 1205 (1954).

Po^{210} 84 126 138.4^d

τ 138.4005^d *58* calorimeter

Five samples measured during 100-350 days

J.F.Eichelberger, K.C.Jordan, S.R.Orr, J.R.Parks, Phys. Rev. 96, 719 (1954).

$\gamma/\alpha = 1.21 \pm 0.06 \times 10^{-5}$ γ scin, α calorimeter

R.W.Hayward, D.D.Hoppes, W.S.Mann, J.Research, Nat. Bur. Standards 54, 47 (1955).

Po^{211} 84 127 0.52^s

α	0.53%	6.569	d 7.5^{h}At; s
	0.50%	6.895	
	99%	(7.43)	

No 6.34 α (< 0.02%)

R.W.Hoff, UCRL-2325 (1953).

At^{210} 85 125 8.3^h

α	0.063%	5.355		s
	0.053%	5.437		
	0.064%	5.519		
γ	199*	0.0446		sd ce
		$L_{12} : L_3$	M : N = 100 : 48 : 41 : 10	
	33*	0.115	K : L : MN = 100 : 17 : 14	
	56*	0.243	$\alpha_K = 0.11$	E2
			K : L : MN = 100 : 83 : 25	
	1.8*	1.189	K : L = 100 : 21	
			$\alpha_K = 4.8 \times 10^{-3}$	E2
	0.21*	{1.458 / 1.504}	$\alpha_K = 1.2 \times 10^{-3}$	E1

No 0.511 γ (< 5%) scin

*Relative intensity ce

R.W.Hoff, UCRL-2325 (1953).

At^{211} 85 126 7.5^h

		Bi^{209}(38-Mev α,2n)	chem
α	5.862		s

$\epsilon_K/\epsilon_L \sim 7$ from K x rays/L x rays = 3.1; scin, pc

R.W.Hoff, UCRL-2325 (1953).

Rn^{218} 86 132 0.019^s

α	7.127	d 20.8^{d}U	scin
γ	0.609		scin

F.Stephens, Jr., F.Asaro, I.Perlman, Phys. Rev. 96, 1568 (1954).

Ra^{222} 88 134 38^s

α	6.554	d 20.8^{d}U	scin
γ	0.330		scin

(6.23 α)(0.330 γ)(θ) J = 0, 2, 0

F.Stephens, Jr., F.Asaro, I.Perlman, Phys. Rev. 96, 1568 (1954).

Ra^{223} 88 135 11.7^d

τ 11.68^d *6* pc

Counted over period of 116 days

G.R.Hagee, W.L.Curtis, G.R.Grove, Phys. Rev. 96, 817A (1954).

Ac^{227} 89 138 22^y

β^-	100%	0.0455 *10*	47 pc

P-K linear ($E_\beta > 0.007$)

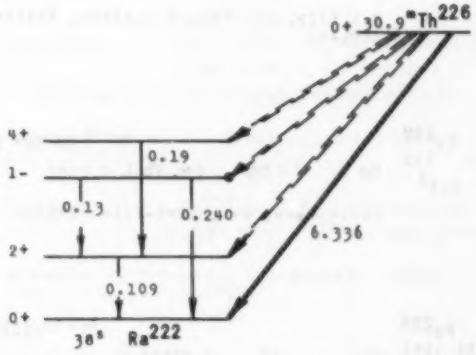
No 0.037 γ, no ce, no Th L x rays pc

W.Beckmann, E.Huster, Z.Naturf. 10a, 86 (1955).

Th^{226} 90 136 30.9^m

α		6.336	d 20.8^{d}U; scin
γ		0.109	scin
		0.13	
		0.19	
		0.240	

(6.10 α)(0.240 γ)(θ) J = 0, 1, 0



F.Stephens, Jr., F.Asaro, I.Perlman, Phys. Rev. 96, 1568 (1954).

Th^{227} 90 137 18.2^d

τ 18.17^d *8* pc

Counted over period of 116 days

G.R.Hagee, W.L.Curtis, G.R.Grove, Phys. Rev. 96, 817A (1954).

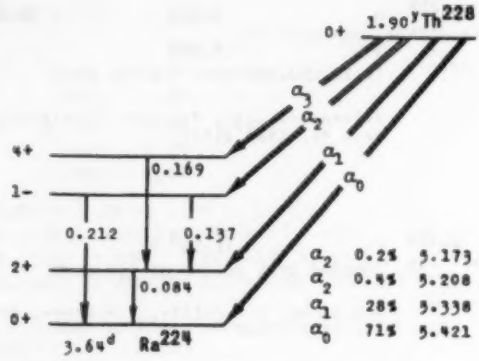
Th^{228} 90 138 1.90^y

(5.21 α)(0.212 γ)(θ) J = 0, 1, 0

(5.34 α)(0.084 γ)(θ) J = 0, 2, 0

(CONTINUED)

Th^{228} 90 138 1.90y



F.Stephens, Jr., F.Asaro, I.Perlman, Phys. Rev. 96, 1568 (1954); 92, 1495 (1953).

Th^{234} 90 144 24.1d

β^-		~0.10		βγ scin
γ	6.5%	0.029	α_L = 10*	scin
	6.5%	0.064	α_L = 0.25*	
	14.8%	0.093	α_L = 2.5*	

(~0.10 β)(0.029 γ, 0.064 γ, 0.093 γ)
(0.064 γ)(0.029 γ) No (0.093 γ)γ
*Using ce data of Stoker et al.

S.A.E.Johansson, Phys. Rev. 96, 1075 (1954).

D 6.66hPa 0.63 ± 0.06% from (1.18mPa β⁻)/(6.66hPa β⁻) GM

W.L.Zijp, Sj. Tom, G.J.Sizoo, Physica 20, 727 (1954).

Pa^{232} 91 141 1.3d

		Th^{232}(9-Mev p,n)	chem
No ϵ_L	(< 2%)	(No Th L x ray)	cryst

C.I.Browne, Jr., UCRL-1764 (1952).

Pa^{233} 91 142 27.4d

			Th^{232}(pile n)	chem
γ	5†	0.02867	2	cryst
	4†	0.04047	10	
	110†	0.0754	2	
	144†	0.0870	3	

C.I.Browne, Jr., UCRL-1764 (1952).

Pa^{234} 91 143 1.18m

β^-		~1.35			βγ scin
γ	<0.19†	0.250	0.00†	(0.81)	scin
		0.33 ?	0.37†	1.00	
		0.38 ?	0.04†	1.81	
	0.12†	0.75			

(~1.35 β)(1.00 γ) (~0.6 β)(1.81 γ)
β(0.75γ)/β(1.00 γ) not f(E_β) for E_β > 0.7
†Photons per 100 Th^{234} disintegrations

S.A.E.Johansson, Phys. Rev. 96, 1075 (1954).

Pa^{234} 91 143 6.66h

τ		6.658h 12	d 24.1dTh	chem

Background of 24.1dTh ~0.2%

W.L.Zijp, Sj. Tom, G.J.Sizoo, Physica 20, 727 (1954).

γ	<0.19†	0.250	Th^{234}	chem scin
	0.06†	0.76		
	0.07†	0.91		
	0.02†	1.68		

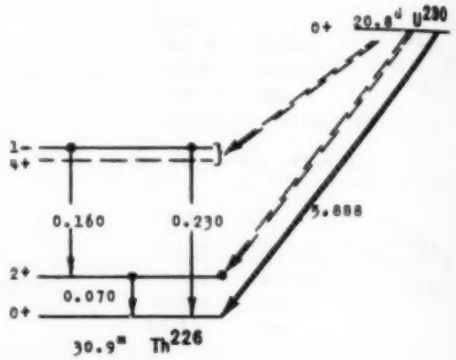
(0.91 γ)(0.25 γ)/(0.91 γ)(0.76 γ) ~1
†Transitions per 100 Th^{234} disintegrations

S.A.E.Johansson, Phys. Rev. 96, 1075 (1954).

U^{230} 92 138 20.8d

α		5.888	scin
γ		0.070	scin
		0.160	
		0.230	

(5.66 α)(0.160 γ)(θ) Isotropic*
(5.66 α)(0.230 γ)(θ) J = 0, 1, 0
(5.82 α)(0.070 γ)(θ) J = 0, 2, 0
*0.230 level interpreted as 4+, 1- doublet



F.Stephens, Jr., F.Asaro, I.Perlman, Phys. Rev. 96, 1568 (1954).

U^{236} 92 144 2.39x10⁷y

Resonances	$U^{(235)}$(n,f)	E_n = 0.01 to 0.4 ev	
	~-0.7 ev	if Γ_f^2 ~0.3	cryst
	~+0.28		

D.Popovič, J. Nuclear Energy 1, 3, 170 (1954).

U^{239} 92 147 23.5m

Resonances $U^{(238)}$(n) E_n = 3 to 700 ev

σ_γ (10^3b)	E_o (ev)		Γ (10^{-3}ev)	Γ_γ (10^{-3}ev)
23 ± 3	6.70	6	25.5 ± 2.0	24 ± 2
31 ± 6	20.9	2	33 ± 5	25 ± 5
37 ± 8	37.0	3	61 ± 7	29 ± 9
24 ± 10	66.5	7	44 ± 10	17 ± 10
	81.6		166	278
	90		192	297
	104		212	368
	118		242	418
	146		258	

R.S.Carter, Phys. Rev. 98 (1955). BAPS 30, #1, (New York), HA3; verbal report.

Np^{234} 93 141 4.4^{d}

U^{235}(19-Mev d,3n) chem

γ 50† {(0.76) (0.81)} unresolved scin
40† 1.57
100† K x ray
70† L x ray

$\epsilon_K/\epsilon_L \sim 1.0$

R.W.Hoff, UCRL-2325 (1953).

Np^{235} 93 142 410^{d}

No γ observed

R.W.Hoff, S.G.Thompson, Phys. Rev. 96, 1350 (1954).

Np^{236} 93 143 22^{h}

U^{235}(12-Mev d,n) chem

$\epsilon_K/\beta^- = 43/57$ from (K x ray)/(Pu^{236} α)
No 0.150 γ scin

M.Jaffe, UCRL-2537 (1954).

Np^{236} 93 143 >5000^{y}

U^{238}(21.6-Mev d,4n) chem ms

τ_β >5000^{y}
σ(n,f) = 2800
No α's observed other than Np^{237} α's ic

M.H.Studier, J.E.Gindler, C.M.Stevens, Phys. Rev. 97, 88 (1955).

Np^{237} 93 144 2.2x10^{6}y

g for 0.060 level = 1.4 ± 0.2 $\alpha\gamma(\theta,H)$

V.E.Krohn, T.B.Novey, S.Raboy, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), S10; verbal report.

Np^{238} 93 145 2.1^{d}

No U L_η x ray (<4%) cryst

M.Jaffe, UCRL-2537 (1954).

Resonances Np^{237}(n) E_n = 0.02 to 3 ev
0.489 ev σ_o = 2600 Γ = 0.032
1.34 $\sigma_o\Gamma \sim 29$ cryst
1.49 $\sigma_o\Gamma \sim 140$

W.S.Smith, R.R.Smith, E.G.Joki, J.E.Evans, Phys. Rev. 99 (1955);
BAPS 30, #3 (Washington), B6 (1955).

Np^{239} 93 146 2.33^{d}

J 1/2 S

J.G.Conway, R.D.McLaughlin, Phys. Rev. 96, 541 (1954).

$U^{(238)}$(pile n) chem

γ 5† 0.0576 *3* cryst
25† 0.0618 *3*

M.Jaffe, UCRL-2537 (1954).

Pu^{234} 94 140 9^{h}

No γ (< 0.5%) U^{235}(36-Mev α,3n) scin

R.W.Hoff, UCRL-2325 (1953).

Pu^{237} 94 143 40^{d}

τ 40^{d} U^{235}(36-Mev α,2n) chem
Np^{237}(9.5-Mev p,n) chem

γ 39† ~0.064 ($\alpha_L \sim 1.1$) scin
x 100† K x ray
77† L x ray
ϵ(0.060 level)/ϵ(g.s.) = 0.56

R.W.Hoff, UCRL-2325 (1953).

Pu^{238} 94 144 90^{y}

γ 0.0436 *3* $L_2, L_3 > L_1$* E2 s ce
$\tau < 5\times10^{-10}$s
0.1000 *4* $L_2, L_3 > L_1$* E2

E.L.Church, A.W.Sunyar, Phys. Rev. 98 (1955).
BAPS 30, #1 (New York), S5; *verbal report.

γ (0.0438) α_{L_2} = 420* cryst
α_{L_3} = 170*

*Using (3.8×10^{-4} 0.0436 photons)/α

M.Jaffe, UCRL- 2537 (1954).

Pu^{240} 94 146 6580^{y}

Resonance Pu^{239}(n,f) E_n = 0.008 to 10 ev
0.298 *2* ev Γ = 0.06ev

σ suggests negative energy resonance also

M.Galula, B.Jacrot, F.Netter, Compt. rend. 239, 1128 (1954).

Resonance Pu^{239}(n,f) E_n = 0.01 to 0.95 ev
0.300 *5* ev Γ = 0.09ev cryst

G.Vendryes, P.Hubert, J.M.Auclair, Compt. rend. 239, 1034 (1954).

Am^{240} 95 145 47^{h}

τ 47^{h} *2*

γ 14† 0.92 *3* scin
70† 1.02 *2*
15† 1.40 *3*

R.A.Glass, UCRL-2560 (1954).

Am^{241} 95 146 470^{y}

No 5.546 α S

F.Asaro, I.Perlman, Phys. Rev. 93, 1423(1954).

γ (0.060) dipole $\alpha,\gamma(\theta)$

T.B.Novey, Phys. Rev. 96, 547 (1954).

Am^{241} 95 146 470^{y}

γ	330†	0.02636 *1*				cryst
	20†	0.03320 *2*				
	24†	0.04346 *9*				
	(4000†)	0.05957 *2*				
	4†	0.103 *2*	0.08†	0.210 *5*		scin
	0.3†	0.113 *5*	0.01†	0.270 *10*		
	0.5†	0.130 *4*	0.03†	0.328 *10*		
	0.04†	0.159 *10*	0.02†	0.370 *10*		

No 0.056 γ, 0.070 γ, (< 1†) cryst

†Photons per 10^4 α's

P.P.Day, Phys. Rev. 97, 689 (1955).

γ	400†	0.02638 *4*				cryst, sd ce
		α < 5.5 E1				
	<100†	0.0332 *1*				sd ce
	<100†	0.0434 *2*				sd ce
		0.056				sd ce_{L3}
	(4000†)	0.05962 *6*				cryst, sd ce
		α = 0.9 α_L = 0.7				
		L_1L_2/L_3 ~4.4 E1?				
	6†	0.0995 *10*				scin, sd ce
		L_2/L_3 ~1.7 E2				
	0.6†	0.128				scin
	vw	0.168 ?				scin
	vw	0.207 ?				scin

(0.0596 γ)(0.0995 γ)*

†Photons per 10^4 α's

M.Jaffe, T.O.Passell, C.I.Browne, I.Perlman, Phys. Rev. 97, 142 (1955); *F.S.Stephens, Jr., Ibid.

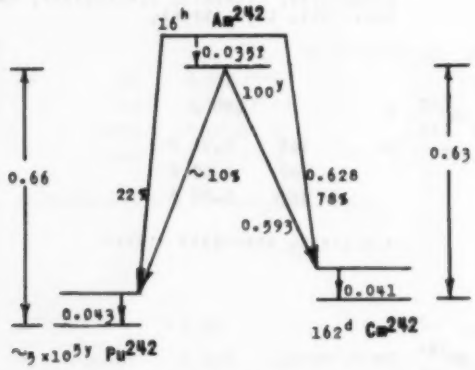
Am^{242} 95 147 16.0^{h}

β^-		0.628	Am^{241}(pile n,γ)			sd
γ		0.041 *2*	α_L > 200			cryst, sd ce
	$L_2 : L_3 : M_2 : M_3 : N$ = 100 : 74 : 67 : 44 : < 22					
		0.043 *2*	α_L > 200			
		$L_2 : L_3$ = 59 : 23				

IT < 5% from L x ray intensities cryst

β^-/ϵ = 3.6 from L x ray intensities

ϵ_K/ϵ_L ~0.7 scin, cryst



R.W.Hoff, UCRL-2325 (1953).

Am^{241}(pile n,γ) chem

γ	7†	0.0423 *2*	α_L = 500		cryst
	6†	0.0448 *2*	α_L = 200		

IT ≤ 6% (from L x ray intensities)

M.Jaffe, UCRL-2537 (1954).

Am^{242} 95 147 100^{y}

ϵ_K ~10% Am^{241}(pile n,γ)

M.Jaffe, UCRL-2537 (1954).

Cm^{241} 96 145 35^{d}

Pu^{239}(27-Mev α,2n) chem

α		5.95 *2*				ic
γ	w	0.065 ?	28†	0.47 *1*		scin
	w	0.163 ?	7†	0.59 *1*		

α/ϵ = 0.007 from Am^{241} growth and α counts

†Photons per 100 disintegrations

R.A.Glass, UCRL-2560 (1954).

Bk^{243} 97 146 4.5^{h}

τ	4.5^{h} *1*	Cm^{242}(16-Mev d,n)	chem
α	~0.15%		
γ	0.07		scin
	0.22		

Higher energy γ's observed

All γ's may belong to Bk^{244}

E.K.Hulet, UCRL-2283 (1953).

Bk^{244} 97 147 ~4.5^{h}

τ	~4.5^{h}	Am^{241}(33-Mev α,n)	chem
γ	0.07		scin
	0.22		

Higher energy γ's observed

All γ's may belong to Bk^{243}

E.K.Hulet, UCRL-2283 (1953).

Bk^{249} 97 152 290^{d}

τ	290^{d} *20*		Pu(pile n)	chem
α	~10^{-3}%	5.40 *5*		ic
β^-		0.08 *2*		a

τ for spontaneous fission ≥ 2×10^{8}y

L.B.Magnusson, M.H.Studier, P.R.Fields, C.M.Stevens, J.F.Mech, A.M.Friedman, H.Diamond J.R.Huizenga, Phys. Rev. 96, 1576 (1954); 94, 1083 (1954).

Cf^{246} 98 148 1.5^{d}

τ for spontaneous fission = 2.1×10^{3}y

E.K.Hulet, UCRL-2283; quoted by P.R.Fields, et al. Nature 174, 265 (1954).

γ	~0.043		α(ce) ppl

D.C.Dunlavey, G.T.Seaborg, quoted by R.W.Hoff, UCRL-2325 (1953).

Cf^{249} 98 151 ~470^{y}

τ	470^{y} *100*		d 290^{d}Bk	chem, ms
α	5.81 *3*			ic

No other α (< 5% of 5.81 α)

τ for spontaneous fission ≥ 5×10^{6}y

L.B.Magnusson, M.H.Studier, P.R.Fields, C.M.Stevens, J.F.Mech, A.M.Friedman, H.Diamond, J.R.Huizenga, Phys. Rev. 96, 1576 (1954); 94, 1083 (1954).

$^{250}_{98}Cf_{152}$ 10^{y}

τ		10.0^{y} 2.4	Bk^{249} (pile n)	chem, ms	
α	10%	5.99 1			ic
	90%	6.03 1			

(5.99 α) (L x ray) No (6.03 α) (L x ray)

τ for spontaneous fission $\sim 1.5\times10^{8y}$

L.B.Magnusson, M.H.Studier, P.R.Fields, C.M.Stevens, J.F.Mech, A.M.Friedman, H.Diamond J.R.Huizenga, Phys. Rev. 96, 1576 (1954); 94, 1083 (1954).

$^{251}_{98}Cf_{153}$ $>18^{d}$

τ_{β}		$>> 18^{d}$	Pu(pile n)	chem, ms	
No α's observed					ic

L.B.Magnusson, M.H.Studier, P.R.Fields, C.M.Stevens, J.F.Mech, A.M.Friedman, H.Diamond J.R.Huizenga, Phys. Rev. 96, 1576 (1954).

$^{252}_{98}Cf_{154}$ 2.2^{y}

τ		2.2^{y} 2	Pu(pile n)	chem, ms	
α	10†	6.08 1			
	90†	6.12 1			

(6.08 α) (L x ray) No (6.12 α) (L x ray)

τ for spontaneous fission $\sim 66^{y}$

L.B.Magnusson, M.H.Studier, P.R.Fields, C.M.Stevens, J.F.Mech, A.M.Friedman, H.Diamond, J.R.Huizenga, Phys. Rev. 96, 1576 (1954); 94, 1083 (1954).

$^{253}_{98}Cf_{155}$ 18^{d}

τ	18^{d} 3	Pu(pile n)	chem
$\beta-$			p 19^{d}99

L.B.Magnusson, M.H.Studier, P.R.Fields, C.M.Stevens, J.F.Mech, A.M.Friedman, H.Diamond, J.R.Huizenga, Phys. Rev. 96, 1576 (1954); 94, 1083 (1954).

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9-
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9-3
ABEL
9-3
ABOLA
9-3
ABOUL
9-2
ABOV
9-7
ABRAG
9-3
ABRAH
9-3
ABRAH
9-4
ABRAH
9-2
ABRAH
9-
ABRIB
9-6
ABRIK
9-6
ABSON
9-2
ACCIN
9-2
ACCIN
9-4
ACHOR
9-6
ACKER
9-1
ACKER
9-7
ACKRO
9-3
ADAIR
9-
ADAM
9-2
ADAM
9-5
ADAM
9-5
ADAMC
9-6
ADAMS
9-1
ADAMS
9-3
ADAMS
9-
ADAMS
9-5
9-5
ADAMS
9-7
ADAMS
9-7
ADAMS
9-7
ADAMS
9-4
ADAMS
9-5
ADAMS
9-1
ADAMS
9-1
ADAMS
9-4
ADAMS
9-4
ADDI
9-
ADDI
9-

PERSONAL AUTHOR INDEX

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The corporate author index immediately follows this index.

For each reference the digit preceding the dash is the volume number and digits after the dash are the abstract number.

AAMODT L C
9-5474 9-5485
AARSET B
9- 250
ABBATT JOHN D
9-3012 9-3018 9-5854
ABEL E
9-3078
ABOLAFIA OSCAR R
9-3452
ABOULKER J
9-2127
ABOV YU G
9-7862
ABRAGAM A
9-3772
ABRAHAM A D
9-5319
ABRAHAM G
9-4273
ABRAHAM S
9-2178
ABRAHAMSON S
9- 30
ABRIBAT MARCEL
9-6116
ABRIKOSOV A A
9-6551 9-6773 9-7050
ABSON W
9-2415 9-5731
ACCINELLI J B
9-2790 9-2791 9-6679
ACCINELLI JOHN B
9-4422
ACHOR W T
9-6538
ACKERET J
9-1014 9-6248
ACKERMANN RAYMOND J
9-7981
ACKROYD R T
9-5193 9-5194 9-6808
ADAIR ROBERT K
9- 425 9- 765
ADAM J
9-2373 9-3000
ADAM J A
9-5599
ADAM JIRI
9-5887
ADAMOVICH M I
9-6012 9-6736
ADAMS D S
9-1838 9-1847 9-3843
ADAMS H K JR
9-3871
ADAMS J A S
9- 134
ADAMS J B
9-5879 9-5880 9-5881
9-5921 9-6154
ADAMS JACK D
9-7632
ADAMS JOHN A S
9-7252
ADAMS MAX D
9-7264
ADAMS N I JR
9-4323
ADAMS PATRICIA T
9-5289
ADAMS RICHARD M
9-7710
ADAMS W R
9-1160
ADAMS WILLIAM S
9-4920
ADAMSON A F
9-4161
ADDISON C C
9- 229 9-6668
ADDISON W E
9-6666
ADENSTEDT HEINRICH K
9-4813
ADER MARIE
9- 808 9-1346 9-6524
ADKINS R
9-7119
ADLAM J H
9-3987 9-7429
ADLER ISIDORE
9-5271
ADLER M
9-6954
ADLER S E
9- 276
ADLOFF JEAN-PIERRE
9-1225 9-4623
ADLON T H
9- 939
ADYASEVICH B P
9-7907 9-7926
AEBERSOLD PAUL C
9- 611 9 4926
AFTANDILIAN VICTOR D
9- 112
AGENO M
9-3565 9-4518 9-4519
9-6521 9-7867 9-7868
AGLINTSEV K K
9-1972 9-7858
AGREST M M
9-1967 9-7466
AGRESTA JOSEPH
9-2849
AGRON P A
9-4933
AGUILAR J
9-6034
AHAMOVSKII L M
9-1933
AHMANN D H
9- 172
AHNLUND KATARINA
9-1087 9-1088 9-1361
9-3304
AHRENS L H
9-6278
AHRLAND STEN
9-2620
AIBA SHUICHI
9-7168
AIKEN W R
9-7999
AITKEN K L
9-5408
AITKEN P B
9- 278
AJZENBERG V F
9-3628
AKERLIND L
9-4627
AKHIEZER A
9-6695 9-7894
AKIMOVA S M
9-5105
ALAGA G
9-2501
ALBA F
9-3309
ALBA FERNANDO
9-6042
ALBANO V
9-3036
ALBERS-SCHONBERG H
9-1348 9-2462
ALBERT A
9-2429
ALBERT HENRY J
9-5359
ALBERT PAUL A
9-4463
ALBERT PHILIPPE
9-6313 9-6314
ALBERT ROY
9-3375
ALBERT ROY E
9-5875
ALBRECHT H O
9-2424
ALBRECHT W M
9-3118 9-5678
ALBRECHT WILLIAM M
9-7288
ALBURGER D E
9- 311 9-4903 9-7196
ALDER BERNI J
9-5084
ALDER F
9- 749
ALDER KURT
9-2501 9-2529
ALDERMAN ILO
9- 39
ALDERMAN ILO M
9-7625 9-7626
ALDERWEIRELDT F
9- 120
ALDRIDGE F T
9-4752
ALEKSEEV F A
9-7778 9-7781
ALEKSEEVA V M
9-7617
ALEKSEEVSKII N E
9-2320 9-2843
ALEKSENKO YU N
9-7952
ALEKSIC TIHOMIR Z
9-5106
ALEXANDER ALLEN L
9-6150
ALEXANDER E
9-7075
ALEXANDER G E
9-1944
ALEXANDER J H
9-7152
ALEXANDER LEROY E
9-1931
ALEXANDER P
9-4356 9-4678 9-5237
9-5617
ALEXANDER PETER
9-6833
ALEXANDER T K
9-2455
ALEXEFF I
9-4590
ALGER R S
9-2369
ALIKHANIAN A
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9-1918
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ALIMARIN I P
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ALLY MONA S
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AMES D P
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AMES S L
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AMMARELLER S
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AMPHLETT C B
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ANAKIN N M
9-3449
ANDERS OSWALD U
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ANDERSON A
9-7587
ANDERSON BONNIE
9-7698
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9-4428
ANDERSON E H
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ANDERSON ELAINE
9-1301
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ANDERSON J S
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ANDERSON KERMIT
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ANDREWS R C
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ANNIS M
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ANSELONE P M
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ANSON J H
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ANTA M C
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ANTHONY J P
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ANTONOVA I A
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AOKI ATSUSHI
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9- 326
APPLE E
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APPLE E F
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APPLEBY D B
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APPLETON W H
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APT L
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ARCHARD G D
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ARD WILLIAM B
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ARGERSINGER W J JR
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ARGO H V
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ARIYAMA KANETAKA
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ARKENBOUT G J
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ARKHARAB V I
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ARMAND MARCEL
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ARMBRUSTER R
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ARMBRUSTER RAYMOND
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ARMINGTON A F
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ARNOLD ARTHUR
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ARROTT A
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ARTHUR G
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ARTHUR PAUL
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ASANO SUMITADA
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ASARO FRANK
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ASCARI A
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ASCOLI R
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ASH E A
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ASHKIN J
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ASHWELL GILBERT
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ASKARYAN G A
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ASKEY C M
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ASKOWITH JOSEPH G
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ASMANES C
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ASPREY L B
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ASTON J G
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ASUNDI R K
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ATEN A H W JR
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ATHAVALE V T
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AUSTIN JERE C
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AUXIER JOHN A
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AWATA MINORU
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AXEL PETER
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AXELROD J M
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AXON H J
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AZUMA TOSHIO
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BACKUS J K
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BAKER R C
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BAKER S J
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BAKER W R
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BALABINA G V
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BALAREW D
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BALLUFFI R W
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BALYGIN I E
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BANKOFF S G
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BANUS M DOUGLAS
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BARANGER ELIZABETH UREY
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BARANOV P S
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BARANOV V I
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BARANOVSKII S N
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BARBER W C
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BARDZIL P
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BARELKO E V
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BAROODY E M
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BARRETT J C
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BARRY T W
9-2405
BARSCHALL H H
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BARSS W M
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BARTHOLOMEW G A
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BARTOK A W
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BARTON DONALD W
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BASKOVA K A
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BASSO JOSEPH A
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9-2197
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BERGER MARTIN J
9-2076
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9-2344
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BERGNA HORACIO E
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BERGSTROM I
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BERING EDGAR A JR
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BERKOWITZ A E
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BERNANOSE ANDRE
9-1974
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BERNARDS M A
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BERNATH LOUIS
9-3447
BERNET A
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BESSOMPIERRE ANDRE
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BHAT GOPALKRISHNA
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BHAVSAR P D
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BIALOUS A J
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BINHAMMER ROBERT T
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BITTER F
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9-1941 9-5391
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BOX GEORGE E P
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BOXALL HELEN L
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BOYD A W
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BROYLES A A
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BRUBAKER DAVID WILLIAM
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BUESSEM W R
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BUHLER H
9-5965
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BUKHSH MOHAMMED NABI
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BULKLEY GEORGE J
9-3378
BULLEN T G
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9-4416

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BUREAU A J
9-2022 9-2023
BURFORD A D
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BURGOS MARIO H
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BUSTRAAN M
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BYERLY WARD M
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BYINGTON PRESTON W
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BYRD NORMAN
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BYRNES VICTOR A
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BYROM J P
9-2446
BYRON E S
9-1276

C PRIETO FERNANDO E
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CACHON ANDRE
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CADDELL R M
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CADMAN R O L
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CADUDAL MLLE
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CAGLIOTI G
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CAHN J H
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CAHN JULES H
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CAHN R W
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CAHOON HAROLD P
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CAIANIELLO E R
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CAILLEAU RELDA M
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CALABRETTA P T
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CALDECOTT RICHARD S
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CALDECOURT V J
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CALDIROLA P
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CALDWELL D O
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CALDWELL DAVID O
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CALDWELL R L
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CALKINS G D
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CALLAGHAN EDMUND E
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CALLON PIERRE
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CALVIN M
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CALVIN MELVIN
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CAMERON A E
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CAMERON A G W
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CAMERON ANGUS E
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CAMILLI ELENA
9- 621 9-1826 9-3461
CAMPANA R J
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CAMPBELL DONALD R
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CAMPBELL E C
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CAMPBELL E E
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CAMPBELL EVAN E
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CAMPBELL GEORGE W JR
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CAMPION P J
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CANDLIN D J
9-4341
CANNING R G
9-5263
CANNON H S
9-3879
CANNON M B
9-4059
CAP FERDINAND
9-5756 9-5823
CAPPS R H
9- 426 9-7212
CAPRON P C
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CARBONE R J
9-5802
CARDAMONE DIANE E
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9-2646
CAREW W F
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CAREW WILLIAM F
9-1845 9-2719
CARLESON B G F
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CARLESON GORAN
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CARLSON BENGT
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CARLSTON RICHARD C
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CARLTON S S
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CARMICHAEL B M
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CARMICHAEL HUGH
9-7416
CARNIGLIA STEPHEN C
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CAROTHERS E L
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CARPENTER ARTHUR W
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CARPENTER D R
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CARPENTER O R
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CARR DONALD R
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CARRICK WAYNE L
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CARRIER G F
9- 138
CARROLL JOHN M
9-4844
CARROLL W R
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CARRON M K
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CARSON W N JR
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CARSTOIU ION
9-1494
CARTER A
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CARTER GILES F
9- 544
CARTER R E
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CARTER R S
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CARTLEDGE G H
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CARVER J H
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CARVER K B
9-6508

CARWILE NESBIT L
9-3205
CASANOVA J
9-5119
CASARETT G
9-5857
CASARETT LOUIS J
9- 62 9-4048 9-5874
CASE K M
9- 347 9-1938 9-7589
CASE S L
9- 633
CASEY J J
9-4408 9-6554
CASLER J A
9-1424
CASSATT W A
9- 293
CASSATT WAYNE A JR
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CASSEN BENEDICT
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CASTAGNOLI C
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CASTELFRANCO J
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CATALA J
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CATALANO EDWARD
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CATER FRED W JR
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CATHCART J V
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CATHEY L
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CATLIN J P
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CAUCHOIS Y
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CAUCHOIS YVETTE
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CAVANAGH MARTIN B
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CAVANAGH R L
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CAVELIERI RALPH
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CAWLEY W E
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CAWTHORNE E W
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CAYREL ROGER
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CECCARELLI M
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CERESNA IVAN
9- 289
CERFONTAIN H
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CERNIGOI C
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CERTAINE J
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CERVASI M
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CHACKETT G A
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CHAIKA M P
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CHAIKOFF I L
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CHAKRAVARTI P B
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CHALLENGER GEORGE E
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CHALLIS H J G
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CHALMERS B
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CHALMERS BRUCE
9-2305
CHAMBERLAIN O
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CHAMBERS DAVID H
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CHAMPEIX R
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CHAMPION F A
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CHAMPION W R
9-2514

CHANDRASEKHAR S
9-5751
CHANG H C
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CHANG SHERMAN S M
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CHANNICK BERTRAM
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CHANSON P
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CHANTRY W A
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CHANUTIN ALFRED
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CHAPEK HENRY T
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CHAPIN E J
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CHAPIRO ADOLPHE
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CHAPMAN M W
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CHAPMAN W H
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CHAPMAN WILLIAM H
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CHAPPELL D G
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CHARLES G W
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CHARLESBY A
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CHARLESWORTH D H
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CHARPAK G
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CHARPAK GEORGES
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CHARTRES B A
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CHASTEL R
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CHATTERJEE G P
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CHATTERJEE S
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CHATTERJEE SANTIMAY
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CHAUDRON GEORGES
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CHAVCHANIDZE V V
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CHEDIN JEAN
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CHEEK C
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CHELEMER HAROLD
9-1807
CHEMLA MARIUS
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CHEN FRANCIS F
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CHENG K L
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CHENG KUANG LU
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CHERNEV A
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CHERNICK J
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CHERNYL G G
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CHERVINSKAYA L S
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CHESNUT CHARLOTTE FORGEY
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CHESNUT D
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CHESTON W B
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CHETHAM-STRODE A JR
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CHEVALLIER P
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CHEVALLIER PIERRE
9-2010 9-7465 9-7505
CHÉVIGNY RAYMOND
9-6327
CHIAROTTI G
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CHIBA R
9- 384
CHIBA SHIN
9-4650
CHICAGO UNIV
9-7256
CHIEN J C W
9-5915
CHIFFELLE THOMAS L
9-3360
CHIKOVANI G E
9- 331
CHILASHVILI G A
9- 380
CHILDERS H M
9-1602 9-6698 9-7031
CHILDS B G
9- 204 9-3243
CHILTON E G
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CHILTON J M
9-4732
CHIN DORIS M
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CHIN J
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CHIN P H
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CHINN HERMAN I
9- 16
CHINOWSKY WILLIAM
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CHIZHIKOVA Z A
9-1758
CHODOROW M
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CHOPPIN G R
9-5306 9-5307 9-6061
CHOQUET ANDRE
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CHORMLEY J A
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CHOU C N
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CHOWDHURY A K
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CHOWDHURY AMALENDU
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CHRIST C L
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CHRISTENBERRY KENNETH W
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CHRISTENSEN CARL J
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CHRISTIAN E J
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CHRISTIAN RUSSELL H
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CHRISTIAN SHERRIL D
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CHRISTOPHERSON E W
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CHRISTOPHERSON WILLIAM
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CHUEV V I
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CHURCHMAN A T
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CHWICK ALEXANDER
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CIALELLA CARMEN
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CIARLARIELLO T A
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CIBIS PAUL A
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CIESLICKI M E
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CINI G
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CLAASSEN HOWARD H
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CLAIBORNE H C
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CLAMPITT BERT H
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CLANCY E F
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CLAREUS D
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CLARK A F
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9-7634
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CLARKE E M
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CLASS C M
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CLAUDE RENEE
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CLAUSS FRANCIS J
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CLEMMONS JACKSON J
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CLIFCORN L E
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CLIFF M J
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CLIFFORD C B
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CLINE J F
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CLINK W L
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CLOUD R W
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CLOUDMAN ARTHUR M
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CLOUET DORIS H
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CLOUSE R J
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CLUGSTON HELEN
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CLUSIUS KLAUS
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COBLE R L
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COCHRAN A J
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CODELL MAURICE
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COESTER F
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COLES B R
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COLLAT JUSTIN W
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COLLIE C H
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COLLIER D M
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COLLIN ROBERT L
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COLLINGTON D J
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COLLINS CLAIR J
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COLLINS F C
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COLOMBINO P
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COLWELL L V
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COMAR C L
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COMPSTON W
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COMSTOCK GEORGE F
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COMSTOCK GREGORY J
9-3173 9-6666
COMSTOCK MARJORIE
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CONCANNON J P
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CONDIT R H
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CONFORTO A M
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CONWAY J B
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CONWAY JOHN G
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CONWAY JOSEPH B
9- 57

COOK C F
9- 781
COOK C SHARP
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COOK CHARLES J
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COOK G B
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COOK L G
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COOK M A
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COOK MAURICE
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COOK MELVIN A
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COOKE A H
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COOL HARRIETT T
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COOL R
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COONS MARY C
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COOPER C D
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9-1997
COOPER LEON N
9- 775
COOPER RAYMOND D
9-6484
COOPER W A
9- 324
COOPER W E
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COOR T
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COPELAND L D
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COPELAND PAUL L
9-1562
CORBEN H C
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CORBETT J D
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CORDOVI M A
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CORIN C
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CORINALDESI E
9- 261
CORK BRUCE
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CORK J M
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CORLISS L M
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CORMACK A M
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9-1978 9-2201 9-7462
CORMAN W R JR
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CORNATZER W E
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CORNET I
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CORNEY G M
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CORNFIELD JEROME
9- 39
CORNISH F W
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CORRIGAN KENNETH E
9-2542
CORRIN M L
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CORSON D R
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CORTH R
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CORTINI G
9-1009 9-3615
CORYELL CHARLES D
9- 670
CORYELL KIRBY C
9- 161
COSGROVE JAMES F
9-4729
COSSLETT V E
9-3579
COSTRELL LOUIS
9-3244
COSYNS M G E
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COTTIN M
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COUGHLIN JAMES P
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COULSON CHARLES
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COUND T E
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COURANT H
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COURVOISIER SIMONE
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COUSENS S F
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COWAN C L JR
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COWAN G A
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COWAN HELEN D
9-1740
COWAN ROBERT D
9-1896
COWIE PATRICIA A
9-7263
COWING RUSSELL F
9- 44
COWPER G
9-6402
COX W J G
9-7431
CRABTREE J M
9-6916
CRADDOCK CHARLES G JR
9-4920
CRAFT ALSA D
9-5634
CRAIG D P
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CRAIG DORIS L
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CRAIG HARMON
9-7651
CRAIG LAWRENCE C
9-5327
CRAIG R S
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CRAIGHEAD C M
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CRAMER EUGENE M
9-5954
CRANBERG LAWRENCE
9- 376
CRANDALL W B
9-1497 9-4780
CRANDALL WALTER E
9-1993
CRANE W W T
9-2021 9-6073
CRANSHAW T E
9- 681
CRASEMANN BERND
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CRAWFORD BRYCE JR
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CRAWFORD J H JR
9-5812 9-7181
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CREAMER ROBERT M
9-1895
CREMENS WALTER
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CRESSMAN EARLE R
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CREUTZ E
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CREVECOEUR E
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CREVECOEUR E H
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CREWE A V
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CRIBORN CARL OLOV
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9-1583
CROALL I F
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CROCCO LUIGI
9-3450
CROCKER V S
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CROFTS T I M
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CROMPTON CHARLES E
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CRONKITE E P
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CRONKITE EUGENE P
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CROOKER A M
9-2524
CROOKS DONALD D
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CROOKS R N
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CROSS BRAXTON W
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CROUCH E A C
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CROUGH THOMAS
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CROWELL A D
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CRUSSARD J
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CUER P
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CUER PIERRE
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CUKER E
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CULBERTSON R P
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CULLER GLEN
9-2474
CULLER VAUGHN
9-7124
CULP DAVID
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CUMMINGS JEAN M
9-5233
CUNINGHAME J G
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CUNNINGHAM B B
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CUNNINGHAM R M
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CURCIO J A
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CURIE DANIEL
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CURIE IRENE
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CURR R M
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CURRAN R M
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CURRAN S C
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CURTIS C W
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CURTISS J H
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CURTISS L F
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CUSACK N
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CUTLER IVAN B
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CUTLER JOHN L
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CUTTITTA FRANK
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CVJETICANIN DANE N
9- 909

DAANE A H
9-7987
DAANE ADRIAN H
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DABBS J W T
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DABROWSKI J
9-3298
DAGGETT E H
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DAHANAYAKE C
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DAHL L K
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DAHLER JOHN S
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DAILEY B P
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DAILEY MORRIS E
9-7244
DAION M I
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9-5445
DAKHNOV V N
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DALE W M
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DALEY DANIEL M JR
9- 215 9- 225 9-2299
DALGARNO A
9-1287
DALITZ R H
9-6135 9-7084 9-7518
DALLAVALLE J M
9- 56
DALLENBACH F
9-7239
DALLSPORTA N
9-5135
DALLYN S L
9-3735
DALY R T JR
9- 359
DAMGAARD EVELYN
9- 830
DAMIANOVICH H
9-6887
DAMODARAN V
9-6300
DAMON PAUL E
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DANDLAU CH A
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DANFORTH W E
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DANGERFIELD A D
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DANIEL GEORGE E
9- 41
DANIEL H
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DANIEL R R
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DANIELS EDWARD W
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DANIELS J M
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DANIELSON G C
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DANOS M
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DANS J
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DANSGAARD WILLI
9-1952
DAPPOLONIA E
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DARBY J B JR
9-5070

DARDEN S E
9- 425 9-7125
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DARE W L
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DARMOIS GENEVIEVE
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DARNELL A J
9-2628
DARNELL ALFRED J
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DA SILVEIRA ADEL
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DAS M SANKAR
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DATTA SACHINDRA KUMAR
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DAVENPORT A N
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DAVENPORT T I
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DAVEY A R
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DAVEY PAUL OLIVER
9- 969
DAVID L
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DAVID M
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9-2568 9-2569
DAVIDON WILLIAM C
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DAVIDS NORMAN
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DAVIDSON ARTHUR W
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DAVIES B P
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DAVIES M H
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DAVIES R H
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DAVIS A K
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DAY EMMETT E
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DAY PAUL L
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DAY PAUL P
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DAY R A JR
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DAYTON I E
9-1114
DAZAI T
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DE ALBUQUERQUE DANILO
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DEALLER J F R
9- 703
DEAMICIS EGILDA
9- 44
DEAN C
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DEAN JOHN A
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DEANE HELEN WENDLER
9-4066
DEARBORN ELIZABETH C
9-6639 9-6640
DEARNALEY G
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DEBALL N
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DEBENEDETTI S
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DE BERNARDI E
9- 26
DEBESUVAIS M
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DEBLEY VIRGINIA
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DE BOER J
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DEBOISBLANC D R
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DE BORDE A H
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DEBRAINE P
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DEBRETTEVILLE A JR
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DEBS R J
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DE CARVALHO HERVASIO G
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DECIUS J C
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DECK CHARLES F
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DE COUTEUR K J
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DECROLY CLAUDE
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DEDEN CARL
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DEDRICK K G
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DEESE CHARLES GLENN
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DE FEYFER G D
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DEFORD D D
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DEFORD DONALD D
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DE FRAENZ I G
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DEFRIES R S
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DE GROOT S R
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DEGTYAREV V F
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DE HOFFMANN F
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DE HOFFMANN FREDERIC
9-6745

DEIGEN M F
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DEISLER PAUL F JR
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DEISSLER R G
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DEJACE J
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DEJUREN J
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DE JUREN J A
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DE LABOULAYE H
9-2865
DE LAETER J
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DE LEEMPUT VAN
9- 315
DEL RIO SANCHEZ C
9-1063
DELAHANT ANTHONY B
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DELALLA OLIVER
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DELARIO A J
9-1458
DELAVERGNE LEROY
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DELBECQ CHARLES J
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DELEO RUDOLPH N
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DELEVAUX MARYSE
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DELIMARSKII YU K
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DELIT MAURICE
9- 479
DELLA ROSA R J
9- 62 9-4055
DELLIS A N
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DELONG H K
9-3881
DELUCA L S
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DE MCMILLAN CLARA M
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DE MARCO A
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DEMARCUS W C
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DEMEUR M
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DEMIDENKO S G
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DEMIDOV A M
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DEMMLER A W JR
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DEMOREST HOWARD L
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DEMOS A C
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DEMRICK CARL
9-1794 9-1795 9-1796
9-1809 9-1810 9-1811
DEMUYNCK JEAN
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DENCH W A
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DENHAM JOHN S
9-5425
DENIS P
9-6376
DENIS PIERRE
9- 366 9- 391 9- 770
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DENISON IRVING A
9-3152
DENISOV N G
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DENNEY DONALD B
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DENNEY JOSEPH M
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DENNIER ANDRE
9- 27
DENNIS K S
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DENNIS KENT S
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DENNIS RICHARD
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DENNIS W E
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DENNISON DAVID M
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DENNISON J P
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DENNY C B
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DENSON N M
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DENT JAMES NORMAN
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DE PANGHER JOHN
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DEQUAL B
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DE RAAD B
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DERGE G
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DERGE GERHARD
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DERING J
9-2131
DERINGER MARGARET K
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DERMAN CYRUS
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DER MATEOSIAN E
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DERMINE E
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DERRICK G
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DERYAGIN B N
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DESAI U D
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DESAUSSURE GERARD
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DESCHNER ELEANOR E
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DESER S
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DESESA MICHAEL A
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DESHPANDE P K
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DESORBO WARREN
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DE SOUSA ARTHUR
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DESPAGNAT B
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DESPAGNAT BERNARD
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DESPREZ-REBAUD SIMONE
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DESPREZ ROGER
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DESTAEBLER H JR
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DESTAEBLER HERBERT JR
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DESTRO V P
9-1727
DETKOV S P
9-1883
DETLAF A A
9-1493
DETOEUF JEAN FRANCOIS
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DETRICK LAWRENCE E
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DE TROYER A
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DETTERMAN J S
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DETWILER C J
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DEUBLE NORMAN L
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DEUEL H
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DEUL MAURICE
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DEUTSCH F
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DEUTSCH G C
9- 198 9-4140
DEUTSCHER K
9-4213
DE VALENCE L P
9-7463
DEVER JAMES L
9-2308
DE VILLIERS J W L
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DEVONS S
9-2877
DE VRIEND J A
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DE VRIES A E
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DE VRIES G
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DE VRIES-HAMERLING T
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DE WAARD H
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DEWALD JACOB F
9-1911
DEWAN J T
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DEWAR MELVIN A
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DEWELL E H
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DEWES R A
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DEWEY DAVIS R II
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DEXTER A H
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DEYE R W M
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DIAGUILA A J
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DIALER K
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DIAMOND H
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DIAMOND R M
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DICK J L
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DICK LOUIS
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DICKE R H
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DICKERSON R F
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DICKEY FRED P
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DICKINSON W C
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DI CORATO M
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DIDDENS A N
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DIECKAMP HERMAN M
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DIEKE G H
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DIENES G J
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DIETER G E
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DIETRICH JACOB E
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DIGGES THOMAS G
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DI GIACOMO ARMAND
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DIGIOVANNI H J
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DIGRAZIA HERBERT X
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DIKE R S
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DILLARD PETER H
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DI LUZIO N R
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DILWORTH C
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DINELLI D
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DINGLEDY DAVID P
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DISMUKE S
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DISMUKES EDWARD B
9-2356 9-2357

DISNEY J L
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DITMARS D A
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DITTLER HARRY CLINE
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DIZDAR ZDENKO I
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DIZHELEPOV B
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DMITRIEV A G
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DOANE E P
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DOBROTIN N
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DOBRYNINA T A
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DOBSON ERNEST L
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DOBYNS BROWN M
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DOBZHANSKY THEODOSIUS
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DODD C
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DODD J G
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DODE MAURICE
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DOIG R S
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DOKOUPIL Z
9-3220
DOLAN T J
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DONALDSON J R
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DONALDSON M R
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DOVNAR S A
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DOVZHENKO O I
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DOWDY ANDREW H
9-3368
DOWNEY JAMES ASBURY III
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DOWNING JAMES M
9-4460 9-5357
DOWNS B W
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DOWNS JAMES J
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DOYLE BARBARA
9-2659
DOYLE W L
9- 57
DRAEGER R HAROLD
9-5680
DRAGANIC I
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DRAGANIC IVAN
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DRAGANIC IVAN G
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DROZDOV S I
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DROZIN VADIM G
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DRUNGIS A
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DUFOUR CHARLES
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DUQUESNE MAURICE
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DUTT N K
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DWORNIK EDWARD
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ELINA L M
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EMERSON EUGENE S
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ENATSU HIROSHI
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ENDT P M
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ENGELGARDT V A
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ESTULIN U
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ETIENNE M
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ETZEL H W
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EUBANK HAROLD P
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EWING C T
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EWING W W
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EXTERMANN RICHARD
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EYEIONS D A
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FABER MOGENS
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FAINBERG V YA
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FASSEL VELMER A
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FAST E
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FASTOWSKY W G
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FAUCHER JOSEPH A
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FELD B T
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FELD BERNARD T
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FORM G W
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FORSCHER FREDERICK
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FORSSBERG A
9-2124
FORSSBERG ARNE G
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FORSTAT HAROLD
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FORSTER C F
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FRICK RUTH
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FRINK ELLIS P
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FRISCH H L
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FROEHLICH FRITZ E
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FROMAN P O
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FUCHS A M
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FULLER J B
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FULLER R C
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FULLER R CLINTON
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FULTZ ESTHER D
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FULTZ ESTHER R
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FUNK E R
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FUZIWARA HIROSHI
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GABAY J J
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GARIBYAN G M
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GAUDIN A M
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9- 94
GAUS H
9-2015
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9-1950
GAVRILOV B I
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GAYLORD EBER W
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GEIBIG F C
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GEIL GLENN W
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GEISS W
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GERTZRIKEN S S
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GESCHWIND S
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GHIGO G
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GIANNONI G
9- 135
GIAUQUE W F
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GINZTON E L
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GIORDANO G
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GIORGI ANGELO L
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GITZENDANNER L G
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GIULOTTO L
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GNUCHEV S M
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GOES M L
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GOOD R S
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GRUZIN P L
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GYORGAK C A
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KINGSBURY E
9- 961
KINGSBURY E P
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KINGTON J D
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KINGTON JOE D
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KINNUMEN JORMA
9- 543
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KIRAKOSYAN Z A
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KIRBY RICHARD K
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KIREEV V A
9- 83
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9-1493
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KLARMANN J
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KLEMIC HARRY
9- 164
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9-1954 9-6391
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9- 414
KLEPP H
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KLEVIN PAUL
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KLICK C C
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KLIGERMAN MORTON M
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KLIMENKOV V I
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KNIGHT H A
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KNOP O
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KOECHLIN YVES
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KOEHLER W C
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KOELLING R A
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KOENEN H
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KOENIG R F
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KOIKE H
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KOJAN SELMA
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KOJIMA SHOJI
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KOKSHTEIN S Z
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KOLAR OSCAR C
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KOLBE CARL L
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KOLCHIN ELEANOR K
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KOLEBATOVA V S
9- 536
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KOLETSKY SIMON
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9-2653
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KOOI J
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KOONTZ P G
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KORCHAK L I
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9-2018
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KOSEL GEORGE
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9-1927
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KOUTECKY J
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KOVARIK A F
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KOVASZNAY LESLIE S G
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KOVDA A V
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KOYAMA KARL
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KOYAMA Y
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KOZENY JOSEF
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KOZHEVNIKOV
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KOZINA N A
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KRABBENHOFT KENNETH L
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KRAFT LISBETH M
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KRAITCHMAN J
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KRAMER JOHN J
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KRAMER S
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KRANC GEORGE
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KRAVTSOV V A
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KRAYBILL H L
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KREBS A T
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KREMER D A
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9- 882
KRESTIANINOV A G
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KRIESSMAN C J
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KRIKORIAN OSCAR HAROLD
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KRISHNAMURTHY P V
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KRISHNAN K S
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KRISHNASWAMY N
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KRIVOBOK V N
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KROHMER J S
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KROMAS LESLIE A
9-6703
KRONGAUS A N
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KRONHEIMER ERWIN H
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KROOK M
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KROPVELD R E W
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KROSS ROBERT D
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KRUG J
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KRUGER HUBERT
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KRUGER PAUL
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KRUMBEIN A D
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KRUSCHWITZ HENRY W JR
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KRUSE U
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KRUZHILIN G N
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KUDIELKA H
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KUHL O A
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KUKLEV V G
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KULCSAR FRANK
9-4993
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KULP J LAURENCE
9-1000 9-2004 9-4436
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KUMABE ISAO
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KUMAR KAILASH
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KUMAR SUDHIR
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KUNIN ROBERT
9-3106
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KURBATOV M H
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KURCHATOVA L M
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KURIYAMA KATSUMI
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KUSANO NOBUO
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KUSCH P
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KUSHNERIUK S A
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KUSMIEREK B
9-1715
KUTSENKO A V
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KUTSEV I V S
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KUTSKY ROMAN J
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KUTZ EUGENE R
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KUZIN A M
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KYHL R L
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LABATON V Y
9-3385
LA BELLE CHARLES W
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LABERRIGUE-FROLOW JEANNE
9-2504 9-2955 9-2959
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LABEYRIE JACQUES
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LABRIE ROGER J
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LABY JEAN E
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LACASSAGNE A
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LACHOWICZ S K
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LACOURT ALICE
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LAD ROBERT A
9- 951
LADANY I
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LAFFERTY D L
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LAGE A PL
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LAGERQVIST A
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LAGOWSKI JOSEPH L
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LAHR T N
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LAI J R
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LAIDLER KEITH J
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LAING E W
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LAITINEN H A
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LAITY RICHARD W
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LAJTHA L G
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LAL D
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LAMBERT V E
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LAMER VICTOR K
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LANDECKER K
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LANDENBURG R
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LANDESBERG JACQUES
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LANDIS FRANK P
9- 122
LANDON H H
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LANE A M
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LANZL LAWRENCE H
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LACOSTE
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LARIONOVA V G
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LARKIN S
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LARKINS J
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LA ROCHE GILLES
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LARSEN E I
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LASER H
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LASTOVICA JOHN E
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LASZLO DANIEL
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LAZAR J
9-5237
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LAZARD B
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LAZAREVA L E
9-7925 9-7933
LAZARUS D
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LAZZARINI E
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LEA R M
9-2940
LEACH J S LL
9- 199 9-2764
LEACH S J
9-3695
LEACHMAN R B
9-1365 9-5832
LEAMER R D
9-1678
LEARY JOSEPH A
9-7744
LEAVITT CHRISTOPHER P
9-7172
LE BAIL H
9-1214
LEBEDEV N F
9-5592 9-7801
LEBEDEV V I
9-7932
LEBEDEV YU A
9-4720
LE BERQUIER FRANCOISE
9-2081

LEBLANC J M
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LEBLOND C P
9- 828
LEBOEUF M B
9-2950
LE CAIGNEC R
9-6962
LECHAUGUETTE G
9-7825
LECHEKHLEB V R
9-6723
LECHTMAN E Y
9-6713
LECLAIR T G
9- 756
LE CLAIRE A D
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LECLERC RENE
9-2140
LECOMPTE GEORGE
9-5723
LECRENIER A
9-6644
LE CROISSETTE D H
9- 309
LEDDICOTTE G W
9-1224 9-4730
LEDDY JAMES J
9-6932
LEDERER M
9-6906
LEDERER M MICHEL
9-4900
LEDERER MICHEL
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LEE R E
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LEE RICHARD H
9-5680
LEE T
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LEE T D
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LEEKEMA C H W
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LEES C S
9-2396 9-6916
LEES LESTER
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LEFKER R
9-1026
LEFORT HENRY G
9-2249
LEFORT MARC
9- 580 9-1214 9-1215
9-1216
LEGER EDOUARD G
9-2407
LEGER EDOUARD S
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LEGER P
9-7825
LEGGE D I
9- 133
LEGRAND J P
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LEGVOLD S
9-7166
LEHMAN J STAUFFER
9-1323
LEHMANN PIERRE
9-2896 9-4624 9-7910
LEIBENZON L S
9-1015
LEIBETSEDER F
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LEIBFRIED G
9- 237
LEIFER LESLIE
9-3795
LEIKIN E M
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LEINFELDER P J
9-7245

LEIPUNER L
9- 671 9-1909
LEISS J E
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LEITCH L C
9-3085
LEITNER J
9-5426
LEIVO W
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LELEVIER R
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LEMBERG I KH
9-3343
LEMLICH ROBERT
9-5316
LEMMER H R
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LEMMON RICHARD M
9- 102 9-2198
LEMONICK AARON
9-6001
LEMONS JOE FRED
9-1740
LENEL F V
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9-4164 9-4165
LENIHAN J M A
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LENNING G A
9-1857
LENOUVEL M F
9-1617
LENTZ CARL F
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LEONARD B P
9-2030
LEONARD B P JR
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LEONARD GUY WILLIAM JR
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LEONARD JOHN M
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LEONG G F
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LEONTEV N I
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LEONTEVA I N
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LEONTIC B
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LEOPOLD CHARLES
9-7744
LEOPOLD I H
9- 49
LEPORE JOSEPH V
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LEPOUTRE GERARD
9-1911
LEPRINCE-RINGUET L
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LERCH PIERRE
9-4015
LERMOND C A
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LERNER M W
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LE ROUX ALBERT
9-1747
LE ROUX L J
9-5593
LEROY GEORGE V
9-2535
LESHER E J
9-2688
LESHKOVTSEV V A
9-7897
LETAW H JR
9-1278
LEUBA P
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LEVACHEVA V M
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LEVENE MARTIN B
9-1169
LEVENSON M
9-1424
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9-4894
LEVEQUE ANTOINE
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LEVEQUE P
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LEVI CHRISTIANE
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LEVI E
9-6899
LEVI HILDE
9-1734
LEVI J ELLIOT
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LEVIANT KH L
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LEVICH V G
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LEVIN B E
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LEVIN R W
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LEVINE CHARLES A
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LEVINE HARRY
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LEVINE MORTON A
9-1941
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LEVINE ROBERT
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LEVINE ZELVIN
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LEVINGER J S
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LEVISH MURRAY
9-3158
LEVITAN B M
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LEVY A V
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LEVY ALAN V
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LEVY ARTHUR
9-7274
LEVY EUGENE JACK
9-7259
LEVY M
9-4315
LEVY MAURICE M
9-1140
LEVY PAUL W
9- 232 9-4102
LEW H G
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LEWIN RUTH
9- 511 9-6176
LEWIS G M
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LEWIS I A D
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LEWIS J
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LEWIS J G
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LEWIS J S
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LEWIS J T
9-3672
LEWIS JOHN E
9-6200
LEWIS MARGARET N
9-5191
LEWIS R A
9- 173
LEWIS R H
9-6039
LEWIS W B
9-3714 9-4908 9-5203
LEWIS W J
9-7005
LEWIS WILLIAM N
9-1886
LEWISH WILLIAM THOMAS
9-4771
LEYSE C F
9-5148
LI C W
9- 420 9-1362
LI Y Y
9- 971
LI YIN-YUAN
9-3675
LIARD O
9-6644
LIBBY RAYMOND L
9-4698
LIBBY W F
9-1698 9-5444
LIBERTI F
9- 947
LIBOFF RICHARD
9-4884
LIBSCH JOSEPH F
9-2758
LICHTENBERGER H V
9- 757 9-1428
LICHTLER ELEANOR J
9-7246
LIDDIARD E A G
9-6324
LIDE DAVID R JR
9-2438
LIDEN K
9-2505
LIDIARD A B
9-6363
LIEBERMAN D S
9-1861 9-3685
LIEBERMAN JERALD J
9-3209
LIEBERMAN MIRIAM
9-4726
LIEBOW AVERILL A
9-2535
LIEBSCHUTZ A M
9-6508
LIEDSKE WERNER
9-7791
LIEHR A D
9-6936
LIETZKE M H
9-2623
LIHL F
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LIIMATAINEN R C
9-7692
LIKHTMAN V I
9-7007
LILLEHEI C WALTON
9-1721
LILLIE C R
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LILLIE C ROBERT
9-1534 9-3499
LILLIE D W
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LIN CHUN CHIA
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LIN LAN-YING
9-5276
LIND R
9-1745 9-2666
LINDBLOM R A
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LINDELL BO
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LINDEMAN H
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LINDERBERG G K
9-4546
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LINDNER MANFRED
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LINDNER R
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LINDSAY STUART
9-7244
LINEVSKY MILTON
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LINNENBOM V
9-7015
LINSCHITZ HENRY
9- 864 9- 865
LINSLEY JOHN
9- 254 9 5738
LIPCHINA L P
9- 471
LIPETZ LEO E
9-5214
LIPILINA I I
9- 132
LIPKIN HARRY J
9-3979
LIPKIS R P
9- 936
LIPPERT E L JR
9-2346
LIPSITT H A
9-3171
LIPSKY S
9-5287
LIPSON J
9- 282
LISCO H
9-4362
LISS R B
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LITCHFIELD JOHN T JR
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LITHERLAND A E
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LITTLE K
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LITTLE R N JR
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LITTLER D J
9-3284

LITTMAN J
9- 897
LITTON J W
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LIU CHARLOTTE
9-2108
LIU CHIEN
9- 936
LIUBIMOVA E
9-3796
LIVESEY D J
9-6774
LIVESEY D L
9-3757
LIVINGSTON M S
9-5102
LIVINGSTON M STANLEY
9-3992
LIVINGSTON R S
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LIVINGSTON RALPH
9-1687 9-4032
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LIVOVICH A F
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LLEWELLYN W E
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LOASBY R G
9-3695
LOCATELLI B
9-5133
LOCHNER J P A
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LOCK W D
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LOCKE D H
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LOCKE F A
9- 153
LOCKETT E E
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LOCKYER R
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LOEB LEONARD B
9-2423 9-6353
LOEFFLER J
9-2138
LOEVINGER ROBERT
9- 836 9-1981 9-3950
LOFERSKI J J
9-3208
LOFGREN EDWARD J
9-3664 9-5509
LOGAN J K
9-4481
LOGUNOV A A
9- 455 9-7030
LOH Y C
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LOHFT J
9-7423
LOHR H R
9-1231
LOHRMANN E
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LOISELEUR JEAN
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LOITSIANSKII L G
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LOKANATHAN S
9-4254
LOMER W M
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LOMATI R DUGNANI
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LONCHAMP JEAN-PIERRE
9- 319 9- 408 9-3598
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LONDON A L
9-4983
LONG ALTON L
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LONG EARL
9-3897
LONG GEORGE
9-1743
LONG H W JR
9-5881
LONG HAROLD W JR
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LONG J P
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LONG JOHN REED
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LONG R A
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LONG RAY D
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LONG ROGER A
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LONG S A
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LONG W Q
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LONGTON P B
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LONGUET-HIGGINS H C
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LONSJO O
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LOOBY JOHN
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LOOBY JOHN T
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LOONEY W B
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LOONEY WILLIAM B
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LOOPSTRA B O
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LOPES J LEITE
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LOPEZ DE AZCONA J M
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LOPREST F J
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LOPREST FRANK J
9- 58
LORD J J
9-7417
LORD N W
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LORD R C
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LORENTZ WILLIAM N
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LORENZ EGON
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LORIA E A
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LORIERS JEAN
9-1788
LORMEAU-LOUSTAU SOLANGE
9-3241
LORRAIN P
9- 385
LOTZ W E
9-7668
LOUGH S ALLAN
9-2604 9-7461
LOUGHEED MARVIN N
9-4682
LOUNSBURY M
9- 67 9-2499 9-2511
LOUTIT JOHN F
9- 837 9-2594 9-3754
LOUW J D
9-1595
LOVATI A
9- 259
LOVE J D
9- 956 9-1261 9-2263
LOVE L O
9-1312 9-1591 9-1592
9-1593 9-1955 9-1956
9-1957 9-2404 9-2406
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LOVE R A
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LOVE S K
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LOVE WILLIAM F
9-5072
LOVEJOY D R
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LOVEJOY EARL M F
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LOVELESS L E
9-1461
LOVELL DONALD J
9- 284
LOVELL F WARREN
9-5838
LOVELL R J
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LOVERING T G
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LOVERING TOM G
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LOVETT P A
9- 149
LOW F E
9-1398 9-3704
LOW J R JR
9-3877
LOW W
9-2904 9-4487 9-4538
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LOW-BEER B V A
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LOWDE R D
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LOWDERMILK WARREN H
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LOWE A E
9-2869
LOWER GEORGE W
9-6865
LOWITZSCH K
9-1309
LOWNIE H W JR
9-3518
LOWRY RALPH A
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LOZANO JUAN MANUEL
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LOZGACHEV V I
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LOZHKIN O V
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LU D C
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LUBARSKY BERNARD
9-3125
LUBITZ C R
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LUBORSKY FRED E
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LUCAS ARTHUR C
9-2046
LUCAS H F JR
9-4360
LUCCHESI C A
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LUCCHESI CALUDE A
9- 513
LUCE JOHN S
9-5558 9-5562
LUCHINA A A
9-3909 9-3910
LUCKEY DAVID
9-2434
LUCKOW W K
9-5503
LUCKOW WILLIAM K
9-4870
LUDERS G
9- 389
LUDERS GERHART
9-2462 9-2528
LUDWIG RUDOLF
9-3526 9-4191
LUEDEMANN LOIS WEISER
9-1826
LUFT N W
9-1754
LUFT ULRICH C
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LUHRS GEROLD
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LUINA A PEREZ
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9-4807
LUIPPOLD HENRY
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LUKESH JOSEPH S
9-1118 9-2497 9-4010
LUKOMSKII S M
9-4434
LULA R A
9-7017
LUMBERT A R
9- 551
LUNA JUAN DE DIOS LEAL
9- 490
LUNDBY ARNE
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LUNDEN ARNOLD
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LUNDGREN NILS P V
9- 877
LUNDQUIST GUSTAV EDWARD
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LUNENOK-BURMAKINA V A
9-5000
LUNING K G
9-3029
LUNSFORD J L
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LUNSFORD JOHN
9- 175 9-2282 9-5341
LUPIEN Y
9-3573
LURCAT FRANCOIS
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LURE B
9-1189
LUSCZ PATRICIA BOSHNA
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LUSTER D R
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LUSTMAN BENJAMIN
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LYAPIDEVSKII V K
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LYNCH DANIEL E
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LYNCH FRANCIS X
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LYNCH FRANK J
9-5100

LYON J L
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LYONS ERNEST H JR
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LYONS J B
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LYTLE E A,L
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MABBOUX C
9-1568
MCALDUFF H J
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MCALLISTER ROBERT W
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MCANDREW J
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MCBEE E T
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MACCIOTTA E
9- 26
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MCCLELLAND CLYDE
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9-1815 9-1816
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MACCOLL ALLAN
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MCCRAVEN C C
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MCCRAVEN M H
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MCCREARY WILLIAM J
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MACDONALD D
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MACDONALD L D
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MACDONALD N S
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MACDONALD WILLIAM M
9-1669 9-4325
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MCELROY D L
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MCELROY R F
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MACFARLANE R R
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MCGANDY E L
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MCGARVEY FRANK
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MACGILLAVRY CAROLINE H
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MCGINNIS CARL L
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MCGOFF M J
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MCGONNAGLE W J
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MCGRATH THOMAS F
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MCGREGOR J F
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MCGRUER J N
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MCGUIRE J C
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MCGUIRE T R
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MCHARGUE C J
9-1836
MCHENRY KEITH W JR
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MACHIDA SHIGERU
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MACHLAN G R
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MACHLIN E S
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MACHT STANLEY H
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MACHTA L
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MACHU W
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MCLAUGHLIN J E JR
9-5235
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MCLAURIN ROBERT L
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MCLEAN A D
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MCLEISH JOHN
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MCLERNON F
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MCMILLAN JUAN A
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MCMILLAN W G
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9-3657
MCMURTRY C H
9-4760
MCNABB WALLACE M
9- 86
MCNAIR A
9- 604 9-6530 9-7200
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MCNEILL K G
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MCNEILL R
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MONKMAN FOREST C
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MONRAD C C
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MONROE ROBERT E
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MOREAU J
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MOSES HARRY
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MOSES LINCOLN E
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9- 21
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MROZOWSKI S
9- 91
MUCKE DIETRICH
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MUDD STUART
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9-3433
MUEHLENKAMP G T
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MUEHLENKEMP G T
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MUENDEL C H
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NABLO S V
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9- 93
NANDA V S
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NEUMAN MAURICE
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NEVENZEL JUDD C
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NEWBERY G R
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NEWCOMBE H B
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NEWMAN EUGENE
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NEWMAN RUTH N
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NEWTON A S
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NEWTON ROGER G
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NEY E P
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NIELSCH WALTER
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NIEMANN JOHN T
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NIERENBERG W A
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NORRIS N
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NORWITZ G
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NORWOOD W D
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NOSKOV B M
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NOSOV V G
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NOTTER G
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NOTTINGHAM WAYNE B
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NOVOZHILOV YU V
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NOWOTNY HANS
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NUKIYAMA SHIRO
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NUSSBAUM R H
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9-2633
NUZHDIN N I
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NYGARD JOHN C
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NYMAN P O
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NYSTROM J
9-4618
NYSTROM ROBERT F
9- 871

OAKBERG EUGENE F
9-5217
OAKLEY D C
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OAKLEY W D
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OBENSHAIN F E
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OBERLE E M
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OBERSTE-BERGHAUS
9-6571
OBREIMOV I V
9-7300
OBRIEN M C M
9-4655
OCCHIALINI G P S
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OCEALLAIGH C
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OCKERMAN JOHN B
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OCON CARLOS VELEZ
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OCONNOR JOHN J
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OCONOR V J
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ODA ZENJIRO
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ODIAN A
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OFARRELL M P
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OFFICER V C
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OFNER GERHARD
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9-4775
OLT R G
9-1236 9-1479
ONEDA SADAO
9-5821
ONEIL DONALD P
9-6875 9-6945
ONEILL T A
9-4357
ONG JOHN M JR
9-3381
ONISHI HIROSHI
9-6903

ONISHI TOMIO
9-5894
ONO KEN-ICHI
9-5748
ONSTOTT E I
9-2206 9-4407
OPINSKY A J
9-3872 9-3873 9-7220
OPLER ASCHER
9-5622
OPPELT WINFRIED
9-6714
OPPENHEIM A K
9-2699 9-3136
OPPENHEIM IRWIN
9-1418 9-3892 9-3893
9-7407
ORBAN EDWARD
9-2161 9-2332 9-4060
ORBELI L A
9-7612
ORD MARGERY G
9-4674
ORE AADNE
9-5086
OREAR JAY
9- 310 9-1337 9-1664
9-5449
OREKHOV V D
9-7307 9-7719
ORIANI R A
9- 187 9-5662 9-7674
ORKILD P P
9-2270 9-3831 9-5035
9-5041 9-6987 9-6988
ORLIN J J
9-5182
ORLOV YU V
9-5140
ORLOVSKAYA G V
9-7225
ORMONT B F
9-1866 9-5255
ORNING A A
9- 526
OROURKE R C
9-7587
ORR CLYDE JR
9- 56 9-1789 9-3904
9-4345
ORR RAYMOND
9-4178
ORR W C
9-2613 9-6554
ORR WILLIAM C
9-4408
ORSONI L
9-6482 9-7157
ORTEL W C G
9-5745
ORTH JOHN S
9-2582 9-3727
ORTON K F
9-2126
ORVIS ALAN L
9-2429
OS O
9-4576
OSBORN A B
9-2209
OSBORN K R
9- 532
OSBORNE C V
9-1429
OSBORNE D W
9-1231 9-6866
OSBORNE L S
9-1336 9-1987 9-2882
9-7079
OSGOOD EDWIN E
9-3037
OSHER JOHN E
9-5110
OSHIMA KEICHI
9-7072
OSHIO T
9-1293
OSIKA L M
9-4169
OSIPOV A I
9-7799
OSOKINA R M
9-9508 9-5779
OSTER I I
9- 30 9-7235
OSTRACH SIMON
9-2229
OSTROUMOV V I
9-7538 9-7540 9-7935
OSTROVSKII V S
9-7007
OSULLIVAN R S
9-5330 9-5331
OSWALD A
9-1124
OSWALD LARRY G
9-3253

OTA MORIRO
9-5894
OTERO CLARA
9-4092
OTROSHCHENKO G A
9-5513
OTSUKI SHOICHIRO
9-4652 9-5624
OTT DONALD G
9-1600 9-3773
OUGHTERSON ASHLEY W
9-2535
OUTTERIDGE K B
9-4848
OVADIA J
9-2879
OVENSHINE S J
9-4640
OVERAAS H
9-4695
OWEN B G
9-4833 9-7883
OWEN GEORGE E
9-7555
OWEN HENRY R
9-5998
OWREN H M
9-1433
OZEROV E B
9-6743 9-7077 9-7472
9-7881

PACE E L
9-2390 9-3113 9-3413
PACHUCKI C F
9-2641
PACK DOUGLAS H
9-1742
PACK J L
9-2348
PACKER K F
9-7346
PADGETT D W
9-7498
PAEHLER J H
9-6144
PAETZ R A
9-7358
PAGE D I
9-3608
PAGE L A
9-7560
PAGE W R
9-6227
PAHL GEORGE
9-2571
PAIGE B E
9- 533
PAIGE BERNICE E
9-6897
PAIGE HAROLD H
9-2639
PAINE S H
9- 862 9- 563
PAIS A
9-3702 9-7475
PAKE G E
9-3971
PAKHOMOVA N L
9- 345
PAKHRYAEV N E
9-5378
PAL YASH
9- 725 9-1049 9-6013
PALEVSKY H
9-4587
PALIK E D
9-2217
PALLADINO N J
9- 429
PALM A W
9-4087
PALM ANN
9-6895
PALMATIER E D
9-2489
PALME RICHARD B
9-1527
PALMER EMIEL D
9-4700
PALMER G H
9-7852
PALMER J P
9- 371
PALMER JOHN D
9-4662
PALMER L D
9-1492
PALMER PAUL E
9-3170
PALMER R F
9-4733
PALMOUR HAYNE III
9-5644
PALUMBO D T
9-6955

PANCHENKO I D
9-3768
PANCHENKO P D
9-7094 9-7108
PANCHENKOV G M
9-4720
PANDYA SUDHIR P
9-7510
PANETTI M
9- 260
PANISH MORTON B
9-4741
PANNELL J H
9-1174 9-5917
PANOFSKY H A
9- 341
PANOFSKY W K H
9-3308 9-4545
PANSHINSKAYA N M
9-3361
PAPADOPOULOS M N
9-4934
PAPE RUDOLF
9-5220
PAPINEAU ANDRE
9-6006
PAPINEAU LILY
9-2071
PAPKE D M
9-5931
PAPOULAR MORENO
9-1305
PAPUCCI ROLAND A
9-4731 9-5671
PAQUETTE DONALD R
9-6709
PARCEL R W
9-4787
PARCHEN FRANK R
9-5596 9-7726
PARFIANOVICH I A
9-3230
PARIS C H
9- 406 9- 407
PARIS W H
9-5581
PARK HELEN D
9- 41
PARK J C
9-6873
PARK J J
9-1147
PARKER EARL R
9- 970
PARKER EUGENE N
9-5983
PARKER G W
9- 617
PARKER H M
9- 704
PARKER H S
9-4416
PARKER HERMAN W
9-4070 9-4372
PARKER M J
9-4656
PARKER RICHARD H
9-3334
PARKHOMENKO G M
9-7638
PARKINS WILLIAM E
9- 755
PARKINSON D H
9-6684
PARKINSON W C
9-4579
PARKINSON W D
9-3153 9-5814
PARKS JOHN M
9-3493 9-5372 9-6282
PARKS THOMAS D
9-5270
PARLIN RANSOM B
9-3214 9-5987
PARMENTER R H
9-2777
PARMENTIER DOUGLAS JR
9-6416
PARR J GORDON
9-1547 9-7813
PARR W H
9-1783
PARRATT L G
9- 186
PARRIS M W
9-4462
PARRIS W MAXWELL
9-6292
PARRIS WALTER M
9-2276 9-2298
PARRISH W
9-1309
PARRISH WILLIAM
9-4524 9-4525
PARROTT MARSHALL W
9-1477 9-1709 9 7063
PARRY E P
9-2613

PARRY J K
9- 680
PARSHIN S I
9-4411
PARSONS MARGARET A
9-2198
PARTS A G
9-6371
PASHLEY D W
9- 690
PASK JOSEPH A
9-6648
PASSAGLIA ELIO
9-5072
PASSELL T O
9-2063 9-6039
PASSELL THOMAS O
9-6122
PASYNSKII A G
9-7616
PATCHING S W F
9-1830
PATE B D
9-1613 9-3603 9-4527
PATEL N J
9-1383
PATEL P F
9-1383
PATEL SHARAD A
9-6996
PATERSON M S
9-7437
PATRO A P
9-4827 9-4828
PATT DONALD I
9- 22
PATT HARVEY M
9-3015 9-3035
PATTENDEN N J
9-2905 9-4512 9-6921
PATTERSON C
9-1835
PATTERSON CLAIRE C
9-4445
PATTERSON B
9-2834 9-5277
PATTERSON E D
9-6268 9-6653
PATTERSON IRVING G
9-5074
PATTERSON JAMES H
9-4074
PATTERSON M K JR
9- 51
PATTERSON R E
9-2841
PATTI F
9-2599
PATTON B J
9-4577
PATTON FRANCIS M
9- 502 9- 503 9- 504
PATTON H W
9-2672
PATWARDHAN P K
9-5994
PAUL ARMINE DEANE
9-4742
PAUL E B
9-1092 9-2019 9-6503
9-6763 9-7386 9-7544
PAUL R S
9- 696
PAUL RAM CHAND
9-3417 9-3418
PAULEVE J
9-1618
PAULI ROLF
9-1361
PAULISSEN L J
9-5581
PAULSON S R
9-5570
PAULY H
9-5219
PAULY JULES
9-6083 9-6486
PAVLOTSKAYA F I
9-7936 9-7936
PAVLOV YU A
9-6673
PAVLOVA T G
9-5949
PAVONE D
9- 848
PAWEL R E
9-1265
PAWEL RICHARD E
9-5052
PAYNE ANITA M
9-5848
PAYNE JOHN I
9-2107 9-2108
PAYSINGER JOHN R
9-5847
PEAKE H J
9-5724
PEARLMAN HARRY
9- 656

PEARLMAN M
9- 990 9-6923
PEARLSON W H
9-1487
PEARLSTEIN E A
9- 800
PEARSE H E
9-5211 9-5212 9-5841
PEARSE HERMAN E
9-1157
PEARSON RAY L
9-6236
PEARSON W B
9- 727 9-2341
PEASE R S
9-4012
PEASLEE D C
9-1622
PEASLEE ROBERT L
9-5066
PECK R A JR
9-5101 9-5172
PECK RUSSELL A JR
9- 280
PEEBLES GLEN H
9-2990
PEETZ U
9-4486 9-6943 9-7278
9-7310 9-7676 9-7679
PEIERLS R E
9-2479 9-6553
PEIFFER VINCENT G
9-2118
PEKAR S I
9- 460 9-1421 9-1691
9-2091 9-4737 9-4835
9-5092
PEKER L K
9-1350 9-1999
PELCHOWITCH I
9-5128
PELCHOWITCH ISRAEL
9- 310 9-1082
PELLAS P
9-6269
PELLERIN PIERRE
9-5121
PELSER J
9-3960
PEMSLER J PAUL
9- 896
PENDLEBURY E D
9-5829
PENDRED D
9-4641
PENFOLD J
9-3243
PENKINA V S
9-5156 9-5778
PENN ROBERT
9-5053
PENNA-FRANCA EDUARDO
9-5594
PENNEMAN ROBERT A
9-4112
PENNER S
9-4258
PENNEY W G
9-4659
PENNINGTON EDWIN M
9- 730
PEPINSKY RAY
9-2413 9-3236
PEPKOWITZ LEONARD PAUL
9-2162 9-2636 9-4075
PEPPER J H
9- 430
PEPPER T P
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PERCZEK LEON
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PEREL V I
9-7049 9-7837
PEREY MARGUERITE
9-1225
PEREZ J
9- 748
PERFILOV N A
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PERFILOW N A
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PERIO P
9-1794 9-1795
PERKINS D H
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PERKINSON JESSE D JR
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PERL M L
9-2903 9-4555
PERLICK ALBERT
9-7281
PERLMAN I
9- 806 9-1633 9-2063
9-3631 9-4020 9-4319
9-4320 9-6121
PERLMAN MORRIS L
9-7886
PERLOFF WILLIAM H
9-2603
PERLS THOMAS A
9-5679 9-5703 9-6241
9-6242 9-6677 9-6709
PERONA G
9-3307
PERREAU LOUIS
9-6145
PERRET W R
9- 145
PERRIN NILS
9-1327 9-4520
PERRING J K
9-5507
PERROS THEODORE P
9-5903
PERRY J E JR
9-7159 9-7548
PERRY SEYMOUR
9-4920
PERRY TIMOTHY
9-1527
PERRYMAN E C W
9-7010
PERSANO S
9-3307
PERSHIN I I
9-2422 9-4851
PERSICO E
9-6089
PERSON WILLIS B
9-2183
PERUSSIA A
9- 8
PERUSSIA ALDO
9-4686
PESCETTI D
9-1008
PESHKOV V P
9- 665 9-5081
PESIC DIMITRIJE S
9- 885
PETERMANN A
9-1078
PETERS B
9-1049 9-2361 9-3939
9-5732
PETERS HENRY F
9-7383
PETERS RALPH
9-4212
PETERS V
9- 220
PETERSEN DONALD F
9- 14 9-2574 9-3729
9-3733 9-3738 9-6580
PETERSEN E E
9-6214 9-6215 9-6216
PETERSEN OLAF
9- 32
PETERSEN V C
9-3456 9-3858
PETERSON C C
9-6874
PETERSON DOROTHY C
9-5918
PETERSON E W
9-1439
PETERSON JAMES R
9-5129 9-6023
PETERSON L
9-5429
PETERSON MARSHALL B
9-5636
PETERSON R E
9-7460
PETERSON R W
9-1349
PETERSON SIGFRED
9-5882
PETERSON V Z
9-6014
PETERSON W H
9-6679
PETIAU GERARD
9-5541
PETIT GEORGES
9-6225
PETIT GEORGES YVES
9-2697
PETIT J
9-5966 9-6993
PETIT MICHELLE
9-4109
PETRETIC G J
9-3070 9-6620
PETROCCHI JANE
9- 266 9- 267 9- 268
PETROVA O N
9-7613
PETROVIC MIODRAG M
9-1608 9-5151
PETROW HENRY G
9-1700
PETRUCCI G
9- 391 9- 770
PETRUSKA J A
9-4656
PETRZHAK K A
9-5528
PETUKHOV B S
9-1493
PEVZNER M I
9-7932
PEYROU C
9-5134 9-6430
PFALZNER PAUL
9-3042
PFANDER FRIEDRICH
9-6591
PFANN W G
9- 251 9-2753
PFEFFER GERHARD
9-1185
PFLAUM RONALD T
9- 512
PHALNIKAR C A
9-6261
PHELPS A V
9-2348
PHIBBS E
9-1076
PHILIPPONE RICHARD L
9-5338
PHILLIPS BETTY A
9-3434
PHILLIPS C S E
9- 342
PHILLIPS C S G
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PHILLIPS E M
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PHILLIPS G
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PHILLIPS G C
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PHILLIPS H BRUCE
9- 279
PHILLIPS HAROLD O
9-4057
PHILLIPS JAMES A
9-2486
PHILLIPS PAUL H
9-7243
PHILLIPS R J N
9-1694
PHILLIPS R S
9-1553 9-1554
PHILLIPS ROBERT H
9- 338
PHILLIPS W R
9- 363
PHISTER M
9-5413
PIATTI LUIGI
9- 156
PICARD E
9- 717
PICCIONI O
9-1366
PICCIOTTO E
9-3819
PICCIOTTO E E
9-2674 9-2710
PICCIRILLO RONALD
9-1448
PICKARD P L
9- 51 9-3756 9-4378
PICKERING JOHN E
9-6162
PICKUP E
9-4219 9-4540 9-7478
PICON MARIUS
9-3119 9-3352
PIDD R W
9-5787 9-7562
PIEPER G F
9-7875
PIERCE E E
9- 572
PIERCE LOUIS
9-2390 9-3413
PIERCE O R
9-1767 9-5898 9-7709
PIERCE OGDEN R
9-4954
PIERCE R A
9- 370
PIERQUIN BERNARD
9-5871
PIETROKOWSKY PAUL
9-2281
PIGG J C
9-5812 9-7181
PIKE FREDERICK PHILIPS
9-4747 9-4748 9-4771
PILCHER V E
9-6045
PIMENTEL GEORGE C
9-3084
PINCUS GREGORY
9-1165 9-1166
PINGELL A
9-5386 9-5399 9-6190

PINKEL B
9-4140
PINSKER W
9-3130
PINSON WILLIAM H JR
9-4234
PINTO P
9- 260
PIPER E A
9-6008
PIPER T S
9-4368 9-6937
PIPIRINGOS G N
9-2263
PIPKIN FRANCIS M
9-6001
PIRINGER-KUCHINKA ALEXANDRA
9-5220
PIROS R J
9-7673
PIRZIO-BIROLI G
9-6864
PISH G
9- 76 9-1475 9-4638
PISKAREV E V
9-2934 9-4689
PITLER R K
9-3869
PITTENDRIGH L W D
9-4510 9-7450
PITZER E C
9-7986
PIVOVAR L I
9-7563 9-7564
PLACZEK G
9- 347 9-2048
PLAINE HENRY L
9-3022 9-3371
PLAKHOV A G
9-2860
PLAKOV A G
9-4248
PLANKENHORN W J
9- 938 9-3868 9-4137
9-4139 9-4461
PLASSMANN E A
9-1676
PLATONOV P A
9-4203 9-7792
PLATT J B
9-7082 9-7083
PLATT J M
9-2269 9-5005 9-6970
9-6982 9-6983
PLATTE W N
9- 974
PLATZMAN ROBERT L
9-2819
PLAZIN JOHN
9-4857
PLEASONTON FRANCES
9-2078
PLESSET MILTON S
9-3442
PLISKE E C
9-5238 9-7641
PLOTTEL A
9-4059
PLUMB ROBERT C
9-1204 9-5440 9-6200
PLYLER EARLE K
9-1136 9-5897
PLYSHEVSKAYA E G
9-7660
POBEDINSKII M N
9-7644 9-7646
POBERESKIN M
9-2764
POCHIN E E
9-4685
POCHIN E ERIC
9- 300
PODDAR R K
9-7074
PODGORETSKII M I
9- 326 9- 333 9-2915
9-6426
PODGORNYI I M
9-7564
PODGURSKAYA A V
9-5187
POE A J
9- 436 9-6114
POHL E
9-1060
POHL RULING J
9-1060
POHM A V
9-2506
POIANI G
9-1571
POLANYI J C
9-6918
POLESTRA FRANCESCO M
9-1229
POLLARD ELIZA
9-6874
POLLARD ERNEST
9-1160 9-2570 9-3737
9-4349
POLLARD F H
9- 584
POLLING J J
9- 130 9- 203 9-2805
POLLY G W
9-3756
POLLYCOVE M
9-2870
POLO SENTIAGO R
9-3080
POLONIS D H
9-1547 9-7813
POLOVIN R
9-6695
POLVANI C
9- 8
POLYAKOV I M
9-7659
POMERANCHUK I
9-5830 9-7894
POMERANCHUK I YA
9-1378 9-2032 9-2092
9-7597
POMERANTZ M A
9-6796
POMERANTZ MARTIN A
9-1292 9-1306 9-3989
9-4217
POMEY GILLES
9-3537
POMOSHCHNIKOVA N A
9-7617
PON WING G
9-7824
PONCELET EUGENE F
9-1237
POND VIRGINIA
9-3718
PONTECORVO B M
9-5742 9-5743 9-6011
9-6079 9-6743 9-6769
9-7077 9-7472 9-7485
9-7881
PONTOVICH V E
9-7661
POOLE D M
9-6296
POOLE J H J
9-6257
POOLE LORIN K
9-1660 9-2734
POPEL S I
9-1556
POPOV ALEXANDER I
9-2667
POPOV N A
9-7045
POPOVIC DRAGOSLAV
9-1085 9-1145 9-2355
9-6556
POPPE HANNO
9-6570 9-6591
POPPENDIEK H F
9-1492 9-6065
POREMBKA STANLEY W
9-5350
PORETTI G G
9-3602
PORITSKY H
9- 609
PORQIKOV I V
9-7860
POROSHINA M S
9-7863
PORT MARCEL
9-5153 9-5781
PORTER C E
9- 351 9-5136 9-7511
PORTER F T
9-4330
PORTER G
9-5612
PORTER RICHARD F
9-2842 9-5885
PORTER W C
9-5989
PORTO S P S
9-2520
POS A J
9-5816
POSENER D W
9-7966
POSPEKHOV D A
9-1748
POST BENJAMIN
9- 150
POTRATZ HERBERT A
9- 876 9-1762
POTTER A E JR
9-3409
POTTER R M
9- 848
POTTER RICHARD D
9-4453
POTTERS M
9-6913
POTTIER J
9-5171
POUND E F
9-4264
POUND GUY M
9-6266
POUND R V
9-7137
POURADIER JACQUES
9-6116
POURBAIX MARCEL
9-6648
POWELL E W
9-4398
POWELL HARRY S
9-7063
POWELL J E
9-3246 9-5618 9-5621
POWELL J L
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POWELL R A
9- 609
POWELL R L
9- 647
POWELL WILSON F
9-4349
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9-3253 9-7480
POWER W H
9-3757
POWERS E L
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POWERS J P
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POWERS ROBERT W
9- 869
POWERS WILLIAM E
9-7652
PRASAD RAGHUNATH
9-3749
PRATT A W
9-2562
PRATT WILLIAM W
9-2020
PRAY H A
9-4441
PRAY L C
9-3837
PREDVODITELEV A A
9-7402
PREHN RICHMOND T
9-2560
PREISER S
9-6029
PRENGLE R S
9-3131
PRENTKI J
9-7202
PRENTKI JACQUES
9-4547 9-5136
PREOBRAZHENSKII B K
9-7939
PRESENT R D
9-7547
PRESSMAN ASHER
9-1143
PRESTON G
9- 792
PRESTON J M
9-1803
PRESTON M A
9-5466 9-6762
PRESTON OLIVER
9-4166
PRESTON R L
9-7093
PRESTON R S
9-3270
PRESTWOOD R J
9- 876 9-4281
PRESTWOOD RENE J
9-5538 9-5555
PREUSS A F
9-1223
PREVOT F
9-3666
PRICE B T
9-7863
PRICE P C
9-6490
PRICE P J
9-2350
PRICE PETER E
9-2727 9-4455
PRICE T D
9-3262
PRICE WILLIAM E
9-3261
PRIETO F E
9- 758
PRIGOGINE I
9- 997
PRIKHOTKO A F
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PRIMAK W
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PROCTOR B E
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PROMISLOW ALBERT L
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PROSKURNIN M A
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PROTIC OLGA V
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PROVOOST P G
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PRUETT CHARLES H
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PSHEZHETSKII S YA
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PUCKETT N L
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PUGH G E
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PUGH R C
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PUJO ANNE-MARIE
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PUKE MARINA SR
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PULSIFER VERNE
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PURCELL E M
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PUSTOVALOV G E
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PUTNAM J A
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PUTSEIKO E K
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PUTTUCK H E
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PUTTUCK HARRY E
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PYLE ROBERT V
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QUERCIA I F
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QUERIDO A
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RABBITT J C
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RABI I I
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RACHELE JULIAN R
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RADCLIFFE JOHN B JR
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RADER L F
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RADHAKRISHNA P
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RADIN NORMAN S
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RADTKE M G
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RADVANYI PIERRE
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RAESFELD A
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RAETHER H
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RAEZER SPENCER D
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9-5243
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RAHM DAVID C
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RAHMAN A
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RAHMEL A
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RAIBAUM YA D
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RAIBLE R W
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RAINWATER JAMES R
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RAMA
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RAMANIAH M VENKETA
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RAMANNA R
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RAMIREZ ERNEST R
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RAMSEY J B
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RAO S V RAGHAVA
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RAPOPORT HENRY
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RAPOPORT L P
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RAPPERPORT E J
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RASE D E
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RASMUSSEN JOHN O
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RASMUSSEN V K
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RATHKAMP W R
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RATINOV V B
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RAUCH R
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RAVIKOVICH KH M
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RAW C J G
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RAYBURN L A
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RAYNOR G V
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RAYSKI J
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RAZ B J
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READ CHARLES B
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READ T A
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REAGAN DARYL D
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REDFIELD ALFRED G
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REDMOND R F
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REED GEORGE W
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REED J C JR
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REED STANLEY A
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REED T M III
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REES ELIZABETH M
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REGENSTREIF E
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REID J D
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REISS S
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REIST HELEN N
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REITER S F
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REITZ R A
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RHINEHART W A
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RHOADS F A
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RIBNIKAR SLOBODAN V
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RICCI JOHN E
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RICCI R A
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RICCI RENATO
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RICE M H
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RICE M JOHN JR
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RIEBSOMER J L
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RIGG T
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RIGG TYSON
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RIGHTMIRE B G
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RIGHTMIRE ROBERT A
9-1681
RIK-VERNADSKII K G
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RILEY C J
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RILEY E
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RILEY RICHARD F
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RIMSKY-KORSAKOFF V
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RIMSKY-KORSAKOFF V N
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RIOU M
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RIOU MICHEL
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RIPARBELLI CARLO
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RIPLING E J
9-1848 9-6998
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RISSER J R
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ROBERTS M H
9- 157
ROBERTS NEWELL O
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ROE G M
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ROE GLENN M
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ROEDERER JUAN G
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ROEHRICH-GOUSSU O
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ROESCH W C
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ROESCHKE C W
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9-1976 9-3773 9-7447
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ROGGENKAMP PAUL L
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ROGOZINSKI ANATOLE
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ROHR R C
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ROHRIG H
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ROHRINGER G
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ROHSENOW WARREN M
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ROLLOR E A
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ROMANENKO S V
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ROMANOVA T A
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ROMANTSEV E F
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ROME MARTIN
9- 71
ROOBE MARYANNE
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ROOF J G
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ROOS C E
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ROOS K
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ROOTHAAN C C J
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ROPP GUS A
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ROSA R J DELLA
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ROSENBLUM B
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ROSENBLUTH MARSHALL N
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ROSI F D
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ROSS VIRGINIA
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ROSSEL J
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ROYSTON R J
9-3997 9-4265
ROZENFELD A M
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ROZENTAL I L
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RUBENSTEIN H S
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RUBENSTEIN R A
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RUBIN BERNARD
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RUBIN L R
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RUBINOW S I
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RUBY L
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RUBY LAWRENCE
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RUBY S L
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RUBY W R
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RUDOLPH O B
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RUDORFF WALTER
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RUEHLE ROBERT A
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RUEHRWEIN ROBERT A
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RUFF JAMES W
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RUGGIERO ASSUNTA
9-2982
RUGGIERO G
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RUGH ROBERTS
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RUIGH WILLIAM L
9-7267
RULFS CHARLES L
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RUNCIMAN W A
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RUNDLE R E
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RUNDO J
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RUNNER MERVIN E
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RUPP A F
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RUPPENDER ROBERT R
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RUSANOV A K
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RUSH A I
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RUSINOV L I
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RUSS CLEM
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RUSS DONALD R
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RUSSEK A
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RUTH H JEANETTE
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RUTH JOHN M
9-1823 9-1824 9-3823
RUTHER W E
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RUTKOWSKI JOSEPH
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RUTLEDGE GENE P
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RUTTEWITT KURT
9-3184
RYABININ A G
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RYAN R D
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RYBAKOV B V
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RYDBERG J
9-7469
RYERSON F E
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RYLANDER E W
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RYNDIN R
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RYSCHKEWITSCH E
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RYSKIEWICZ E E
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RYVKINA D E
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RYZHANOV S G
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SABLE V H
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SABROFF A M
9-2276
SABROFF ALVIN M
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SACCONI L
9- 135
SACHER GEORGE A
9-2567
SACHS FRANCES L
9-1961
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9-2297
SACHS R G
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SADOWSKI G S
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SAELAND EINAR
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SAITO E
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SAKAI KAORU
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SAKELLARIDIS PAUL
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SALO ALBERT E
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SALOOM J A
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SALTER D C
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SALTER J
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SAMARIN A M
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SAMARINA V A
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SAMIOS N
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SAMMAN ADHAM
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SAMOILOV L N
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SAMOILOV O YA
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SAMOKHVALOV A A
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SAMSAHL KNUT
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SAMSONOV G V
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SAMUEL ALAN J
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SAMUEL P
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SAMUELSON OLOF
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9- 873
SANDBORN VIRGIL A
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SANTISTEBAN M
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SARKES L A
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SARMA B
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SARMA D V N
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SASS L
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SATO IWAO
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SAUL GEORGE B II
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SAULIT V R
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SAUNDERMAN DUANE N
9-7727
SAUNDERS J M
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SAUTER CHARLES
9-1817
SAVAGE H W
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SAVAGE H WESLEY
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SAVAGE W F
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SAVEL M P
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SAVEL PIERRE
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SAYRE EDWARD V
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SAZONOV M L
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SCHAMPERS P P M
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GERTRUDE
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SCHECHTMANN J L
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SCHERRER M
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SCHINZ H R
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SCHISSEL PAUL
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SCHJEIDE O A
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MCKENNEY
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SCHLESINGER STEWART I
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SCHLUTER R A
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SCHNELL W
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SCHNEPS J
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SCHNEYER LEON H
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SCHODDER HELLA
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SCHOENBORN HENRY W
9-1716
SCHOFIELD A E
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SCHOFIELD H Z
9-1820
SCHOLES G
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SCHONBERG NILS
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SCHONLAND B F J
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SCHONLAND D S
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SCHOOLAR JOSEPH C
9-2572
SCHOOLEY JAMES F
9-6911
SCHOPF JAMES M
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SCHOPPER E
9-1940 9-2477
SCHORK P K
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SCHRADER CARLTON D
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SCHRANK GLEN
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SCHREIBER W
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9- 486
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SCHREMP E J
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SCHREYER J M
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SCHROCK VIRGIL E
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SCHRODER MARY E
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SCHROEDER F
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SCHUBERT G
9-3017
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SCHUHL CLAUDE
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SCHULMAN J H
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SCHULTE H J
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SCHULTZ D L
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SCHULTZ J
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SCHULZE H
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SCHUMACHER B
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SCHUMANN HERMANN
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SCHUSELER M
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SCHWARTZ ANTHONY M
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SCHWARTZ CHARLES
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SCHWARTZ H M
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SCHWARTZ M
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SCHWARTZ MANUEL
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SCHWARZ HAROLD A
9-7716
SCHWARZ WILLY
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SCHWARZKOPF PAUL
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SCHWED P
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SCHWEIKER GEORGE C
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SCHWEISTHAL ROBERT
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SCHWEITZER GEORGE K
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SCHWERDTFEGER G
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SCHWERDTFEGER W J
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SCHWERTZ F A
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SCHWIND SIMONE B
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SCHWOPE A D
9-1820 9-3863 9-6384
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SCHWOPE ARTHUR D
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SCIUTI S
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SCOFIELD NORMAN E
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SCOTT ALLEN B
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SCOTT T R
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SCOTTI A
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SCURLOCK R G
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SECCO E A
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SECOY C H
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SECREST E L
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SECREST E LEIGH
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SEDLET J
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SEED J
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SEED LINDON
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SEEGER JOHN W
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SEELMANNEGGEBERT W
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SEGAERT O J A
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SEGE G
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SEGRE E
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SEKIKAWA KYOZO
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SELIGMAN HENRY
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SELIHOV I P
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SELOVE W
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SEMISHIN V I
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SENDA KEI
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SENDEROFF SEYMOUR
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SENITZKY B
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SENSE KARL A
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SERVRANCKX R
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SETLOW RICHARD
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SEYFANG A P
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SEYMOUR P H
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SEYMOUR W E
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SHAFER YU G
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SHORT N M
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SHOSTAKOVICH N V
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SHPINEL V S
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SHPOLSKII E V
9-7970
SHREFFLER R G
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SHRIKANTIA G S
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SHRUBSALL ARTHUR E
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SHRUT M M
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SHTAUBERG I F
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SHURCLIFF WILLIAM A
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SMORODINSKII YA A
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SMUTZ M
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SMYTH CHARLES P
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SNIDER JOHN L
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SNOW G
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SNYDER J N
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SNYDER M J
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SNYDER W S
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SNYDER WALTER S
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SOBERING S
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SOBERMAN R K
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SOBERMAN ROBERT K
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SOBOL S I
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SOBUE HIROSHI
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SODHA MAHENDRA SINGH
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SOFTKY SHELDON DORMAN
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SOGO P B
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SOHONI D K
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SOISTER PAUL E
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SOKILOWSKI E
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SOKOLOFF BORIS
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SOKOLOV A A
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SOKOLOVA Z A
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SOLHEIM A
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SOLMITZ F
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SOLMS J
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SOLNTSEFF N
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SOLOMON A K
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SOLOVEV S I
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SOLOVEV V G
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SOLOVKIN A S
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SOMERVILLE ALEXANDER
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SOULE J H
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SOYE COLETTE
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SPACIL H S
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SPACKMAN W JR
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SPAIN PATRICIA C
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SPALDING FLORENCE F
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SPARKS CULLIE J JR
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SPARROW A H
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SPECK D R
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SPEISER R
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SPIERS F W
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STIER P M
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STOPPANI A O M
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STORY J S
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STOUGHTON R W
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STOUT R B
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STOVER EDWARD R
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STOW R M
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STRAHL ERWIN O
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STRAIN HAROLD H
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STUTTGEN G
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SUBOTIC SONJA
9-6487
SUBRAMANIAM A
9-3560
SUCCI C
9- 259
SUCHET J
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SUDAK FREDERICK N
9- 469
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SUESS HANS E
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SUGANOMATA S
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SUGARMAN NATHAN
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SUKHOV L V
9-6771

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SUPPLEE HELEN
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THURSTON WILLIAM R
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TIDBALL R A
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TIDBURY D
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TIECKELMANN H
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TIERS GEORGE VAN DYKE
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TIETZ T
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TIMMA D L
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TINGEY F H
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TINGEY FRED H
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TIPTON S R
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TODD F C
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9-2003

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9-2650
TRILLAT JEAN JACQUES
9-6322
TRIMMER J D
9- 656
TRIPP A M
9- 557 9- 752
TRIPP H P
9-4792
TRIPP R
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TRIPP ROBERT D
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TRISCHKA J W
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TRISTRAM D R
9-3403
TRITES ALBERT F JR
9-1520 9-4156
TRIVERO G
9-4629
TRIVERO GIACOMO
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TRIVICH DAN
9- 519
TROFIMOV A B
9-6340
TROIANO A R
9-5686
TROIANO ALEXANDER R
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TROJAN PAUL K
9-5971
TROMBE FELIX
9- 902
TROTTER C L
9- 622 9-1511 9-1327
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TROUT E DALE
9-2046
TROUT T M
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TROY W C
9-3538
TROYER MAX L
9- 627
TROZERA T A
9-2732
TRUELL ROHN
9- 260
TRUESDALE G A
9- 613
TRUJILLO T T
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TRUM B F
9-5227
TRUM BERNARD F
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TRUMP J G
9- 253 9-1366
TRUMPY B
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TRUMPY G
9-2481
TRUMPY GEORG
9-7505
TRUSWELL A E
9-1210
TSAI CHU
9-2611 9-3234 9-6433
TSAKONAS S
9-5937
TSEITLIN KH L
9- 158
TSELLINSKAYA T F
9- 68
TSIEN K C
9-6178
TSIKLIS D S
9-3239
TSIVOGLOU E C
9- 496
TSOUKALLO S O
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TSUKADA KINEO
9-1303 9-1340
TSUKKERMAN I I
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TSUZUKU TAKURO
9-2653
TSYTOVICH V N
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TUANUTOVA G V
9-5397
TUBIANA MAURICE
9-4927 9-5871
TUCHSCHMID H E
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TUCKER CHARLES W JR
9- 428 9-1209 9-7835

TUCKER H
9-6873
TUCKER J T JR
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TUCKER W D
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TUESDAY CHARLES S
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TUFTS COLL
TUGARINOV A I
9-2712
TUKEY H B
9- 9
TULLOCH E J
9-3871
TUNITSKII N N
9-5417
TUNNELL W C
9-8012
TUPPER R
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TURANSKAYA A N
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TURCHINETZ M
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TURGEON J C
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TURK ELTON H
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TURNBULL A H
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TURNBULL B
9-7352
TURNBULL DAVID
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TURNER D H
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TURNER J F
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TURNER L B
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TURNER R B
9- 308
TURNER S E
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TURNEY DONNA FAYE
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TURPAEV T M
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TURTON C NIGEL
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TUSTANOVSKII A A
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TUTHILL SAMUEL M
9-1199
TYABLIKOV S V
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TYAPKIN A A
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TYKODI R J
9-4366
TYLKINA M A
9-5069 9-5967
TYREE S Y
9- 72
TYREN HELGE
9- 768 9-1410 9-2673
TYZACK C
9-6182

UANOSHI L
9-5396
UBERALL H
9-6812
UDIN HARRY
9-1327
UEHLING EDWIN A
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UHLER ULLA
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UI HARUO
9- 404
ULM RICHARD W
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ULTEE CASPER J
9-1770
UNDERHILL L H
9-6795
UNDERWOOD NEWTON
9-1951
UNGAR FRANK
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UNGAR GEORGES
9- 833
UNTERMYER S
9-3433

UNTERMYER SAMUEL
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UPHAM HARVEY C
9-5838
UPHOFF DELTA E
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UPTON ARTHUR C
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UREY HAROLD C
9-3065 9-3226 9-7302
URIVETSKY M
9- 124
URRY GRANT
9-7266
URSENBACH W O
9-2384
USANOVICH M
9-3762
UTLAUT WILLIAM J
9- 289
UTTERBACK NYLE G
9-1599
UYEDA RYOZI
9-4232
UZHIK G V
9-1867

VACCA GEORGES
9-6145
VACIRCO S
9-4522
VAIL C R
9-1554
VAIL D B
9-7746
VAINSHTEIN B K
9-2033
VAINSHTEIN E F
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VAISBERG S E
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VAISBERY S E
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VAISMAN I A
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VALADARES MANUEL
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VALCKX F P G
9- 406
VALDIVIA J
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VALDRE U
9-5692
VALENTINE J W
9-8005
VALET GERHARD
9-7277
VALIENTE E ALONSO
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VALLADAS G
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VALLE C F JR
9-4243
VALLETTA R M
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VALUEV B N
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VAN ALLEN J A
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VAN ANTWERPEN F J
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VAN ARKEL A E
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VAN ARTSDALEN E R
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VAN BARNEVELD E J
9-5895
VANCE FRANK P
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VAN CLEAVE C D
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VAN CLEVE A
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VANCOUR ROGER P
9-4247 9-5117
VAN DALEN E
9-2219 9 4735
VAN DEN BERG C B
9-4501
VANDENBERG L B
9-7969
VANDERHAEGHE G
9-2851
VAN DER LEUN C
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VAN DER MEULEN P A
9-7267
VAN DER RAAY H V
9-5785
VAN DILLA M A
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VANDONI ROBERT
9-2140

VAN DRIEST E R
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VAN DYKE J G
9-5238 9-7641
VANECHO JOHN A
9-1854
VANGO STEPHEN P
9- 75
VAN HECKE M F
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VAN HOVE L
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VANIER J
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VAN KRANENDONK J
9-1012
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VAN NESS H C
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VAN NOOYEN B
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VAN PATTER D M
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VAN RENNES A B
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VANRENNES ALBERT B
9-3588
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9- 251
VAN ROSSUM L
9- 325 9-7490
VAN ROSSUM LUD
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VAN SCIVER WESLEY J
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VAN SLYKE DONALD D
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VAN SLYKE F
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VAN STIJVENDAEL M
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VAN SWAAY L
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VAN UITERT LEGRAND G
9- 869
VAN VOAST JAMES
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VAN VUCHT J H N
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VARBERG TH
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VARLEY J H O
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VARMA JAGDISH
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VARSHAVSKII YA M
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VASENIN R M
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VASH A M
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VASHAKIDZE I SH
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VASILEV L I
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VASILEVA V N
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VASILYEV S S
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VASSAMILLET L
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VASSY ETIENNE
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VASTA JOHN
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VASTERLING H W
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VAUGHAN HERMAN W
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VAUGHAN J D
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VAUGHAN W
9- 800
VAUGHEN J V
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VAUGHN W W
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VAUTHIER M R
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VAVILOV YU N
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VAWTER F J
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VEALL N
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VECERA M
9- 60

VEENENDAAL A L
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VEERARAGHAVAN N
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VEKSLER V
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VELORIC HAROLD SEYMOUR
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VELTMAN P L
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VENABLE DOUGLAS
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VENDRYES G
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VENDRYES GEORGES
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VENEKLASEN RODGER D
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VENET ANNE-MARIE
9-6116
VENKATESAN D
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VENKATESWARLU K S
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VEOMETT ROBERT C
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VERGA V
9- 31
VERHAEGHE JULIEN
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VERKHOVSKII B I
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VERLE I I
9-2065
VERLET L
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VERM R K
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VERMA M R
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VERMAESEN L
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VERMUND H
9-4353
VERNOV S N
9-3905
VERZAUX PIERRE
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VERZELE M
9- 120
VESCOVI E
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VESELOV I YA
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VEST R W
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VETTE J I
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VETTER H
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VETTER KLAUS J
9-1868
VICKERS R C
9- 165
VICKERY R C
9-3430 9-6615
VICTOR I V
9-5945
VIDAL GEORGES
9-2747
VIDNER PREMYSL
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VIDOVIC VLADO L
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VIENET R
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VIER DWAYNE T
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VIERK A L
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VIGLIONE JOSEPH
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VIGNERON L
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VIGNERON LEOPOLD
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VIGON MARIA DE ARANZAZU
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VIGONE M
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VILLAIRE ALFRED E
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VILLEE C A
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VILLI C
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VINCENT JAMES G
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VINCENT L D
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VINE J D
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VINEYARD GEORGE H
9- 412
VINOGRADOV A P
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9-7941

VINOGRADOV L N
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VINOKUROV S G
9-7746
VIRANUVATTI V
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VIRTS G
9- 115
VISSER P R
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VISTE RENE
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VISWANATHAN ARUNACHALA
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VITALE B
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VIVARGENT M
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VLADIMIROVA I L
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VLADIMIRSKII V V
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VLASOV N A
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VLASYUK P A
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VOCE E
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VOEVODSKII V V
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VOGEL HOWARD H JR
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VOIGT E M
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VOINO-YASENETSKII A V
9-2581
VOLAROVICH M P
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VOLCHOK HERBERT L
9-2004 9-6413
VOLDRICH C B
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VOLF E
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VOLKENSHTEIN F F
9-1930
VOLKENSHTEIN M V
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VOLKIN ELLIOT
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VOLKOFF G M
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VOLKOV A B
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VON BERG R L
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VON BORSTEL R C
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VON BUTTLAR HARO
9-1698
VON DARDEL G
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VON DARDEL G F
9-6719
VON EULER H
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VON EULER HANS
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VON HALLE E
9-2838
VON SALLMANN L
9-7623
VOORHEES HOWARD R
9-7786
VOORHIES H G
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VORESS HUGH E
9-2077 9-7002
VOROBEV E D
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VOROBEV E I
9-7608
VORONTSOV E I
9-6355
VOROTNIKOV P E
9-5169 9-5511
VORRES KARL
9-2190
VORRES KARL S
9-3787
VOSICKI BORIS
9-5122
VOSS M D
9- 558
VOSS R G P
9-5517 9-7146
VOUSDEN J E
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VREEDENBURGH C G J
9- 217
VUCCINO S
9-6112
VYATSKIN A YA
9- 263
VZOROV I K
9-2491 9-2493 9-4886
9-4890

WABER JAMES T
9- 152 9- 155 9- 619
9- 620 9-1823 9-1824
9-3823 9-5322
WACHSPRESS E L
9-4846
WACHTER JAMES P
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WACHTER JOHN W
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WADA MASAMI
9-1566
WADA W W
9-1631
WADA WALTER
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WADDELL CHARLES
9- 767
WADDELL J F
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WADDELL R C
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WADDINGTON C J
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WADDINGTON GUY
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WADE E J
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WADIA DORAB R
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WADSWORTH MILTON E
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WAFFLER H
9-2038
WAGENAAR R O
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WAGMAN DONALD D
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WAGNER R
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WAGNER ROBERT T
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WAHL ARTHUR C
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WAINER E
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WAINFAN N
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WAISMAN J L
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WAIT E
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WAITE T R
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WAJDA E S
9-3188
WAJSBRUM JOSEPH
9-2388
WAKEFIELD ERNEST H
9-1643
WAKERLIN R C
9-1727
WAKESHIMA HIROMU
9-2800 9-4721
WAL RAYMOND P VANDER
9-2155
WALDEN J P
9- 167
WALDFOGLE E A
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WALDRON HAROL F
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WALKER B E
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WALLACE E K
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WALLIS R F
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9- 169
WALT M
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WALTHER E
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WANDEL C F
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WANG TIEN-CHUAN
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WAPSTRA A H
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WARD A
9-6491
WARD A G
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WARD A H
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WARD A L
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WARD E
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WARD M
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WARD ROLAND
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WARDLAW W
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WARMOLTZ N
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WARNER GEORGE F
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9- 4

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WARTIK THOMAS J
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WASHBURN JACK
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WASILEWSKI R J
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WATTS R W E
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WEATHERS GERALD
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WEBB BRUCE P
9- 161
WEBB FRANCIS H
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WEBB L A
9-7456
WEBB T S
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WEBBER HENRY A
9-2780
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WEBSTER J W
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WEILL ADRIENNE R
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WEIR CHARLES E
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WEISSLER G L
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WENDLANDT WESLEY W
9-2667 9-5920
WENESER J
9-4270
WENK P
9- 193
WENNERBERG ANN
9-4104
WENNERSTRAND BERTIL
9- 543
WENTWORTH R L
9- 520 9- 521 9-3383
WENTZ W W
9-2296
WENZL F
9-4225
WERGELAND H
9-4595
WERNER FRANK D
9-3578
WERNER G K
9-4640
WERNER K
9-6588
WERNER R C
9-4179
WERNET J
9-2148
WERNING JOSEPH R
9- 907
WERTHEIM M S
9-1414
WEST D
9-7870
WEST E D
9-1252
WEST EMORY
9-6828
WEST H I JR
9- 312
WEST J B
9- 586
WEST PHILIP W
9-2169 9-3436 9-6905
WEST ROBERT HARRY
9-5167
WEST WALTER S
9- 628 9-6967
WESTENDORP W F
9-1370
WESTERVELT DONALD R
9- 852
WESTLAND G J
9-2188
WESTON RALPH E JR
9-7440
WESTRUM E F JR
9-1231
WESTWATER J W
9-6253
WETHERILL GEORGE W
9- 626
WETHINGTON J A JR
9-4951
WEVER F
9-5385
WEVER H
9-4214
WEXLER S
9-2005 9-6058
WEY R
9-6559
WEYMOUTH PATRICIA P
9-2558
WHALIN E A JR
9-2469
WHALING WARD
9- 794
WHALLEY E
9-3573 9-7843
WHATLEY M E
9- 592
WHEATLEY J C
9-6060
WHEELER C M
9-4145 9-5297
WHEELER CHARLES M JR
9-2679

WHEELER G V
9-6896
WHEELER H L JR
9- 630
WHEELER THOMAS E
9-5903
WHEELWRIGHT E J
9-5618
WHERRY T C
9-5416
WHETSEL H B
9- 902
WHIPPLE G HOYT
9-4049
WHITE A G
9-6720
WHITE A O
9-3288
WHITE A S
9- 591
WHITE CHARLES E
9-1895
WHITE CLAYTON S
9- 877 9-3359 9-3360
WHITE DAVID
9-3081 9-6205 9-6369
WHITE F A
9-2401 9-6000
WHITE G N
9-7577
WHITE HARRY J
9-4426
WHITE HOWARD J JR
9- 922
WHITE J C
9-3411 9-5258 9-5260
WHITE J N T
9-6257
WHITE JULIUS
9-2568 9-2569
WHITE L E
9-3399
WHITE LOCKE JR
9-3775
WHITE MARCIA R
9-4362
WHITE ROBERT L
9-2647 9-2985
WHITE RUSSELL R
9-6188
WHITE WILLIAM C
9-5918
WHITEHEAD C
9- 764
WHITEHEAD MARIAN N
9-5129 9-6023
WHITEHEAD THOMAS NORTH
9-2836
WHITEHOUSE DAVID R
9-3589
WHITING ANNA R
9-2573 9-2592
WHITING F B
9-3587
WHITMORE G F
9-1978
WHITNEY IRA B
9-7668
WHITNEY RAE
9- 22
WHITTAKER D R
9-6260
WHITTEMORE W L
9-2940 9-4257
WHITTEN FRANK I
9-5680
WHITTLE CH
9-4562
WHYARD R E
9-2869
WHYTE G N
9-2490
WIBERLEY STEPHEN E
9-4699
WICHTERMAN RALPH
9-6847
WICKE E
9- 894 9-6250
WICKERSHAM ARTHUR F
9- 377
WICKHAM R J
9-1041
WICKHAM ROBERT
9-3197 9-5369
WIDDOES L C
9-5503
WIDDOES LAWRENCE C
9-4870
WIDGOFF M
9-6016
WIEDENBECK M L
9- 439 9-2062 9-7118
WIEDERKEHR V R
9-4074
WIEDLING T
9-3689 9-4627
WIEGAND C
9- 789 9-4607
WIEGANDT H F
9-5300
WIESNER J B
9- 652 9-4210 9-7025
WIGNALL J W G
9-7158
WIGNER EUGENE P
9-3712 9-3713 9-4335
9-7585
WIIG EDWIN O
9-1091
WILCOXON FRANK
9-2846
WILD JOHN J
9-2541
WILD WOLFGANG
9- 456
WILDE WALTER S
9-3032
WILDER D R
9-1213
WILDERMUTH KARL
9- 466
WILDING JAMES L
9- 13 9-2572
WILES D M
9-3691 9-6127
WILES DONALD R
9- 670
WILETS LAWRENCE
9-2902
WILEY R C
9-3858
WILHELM H A
9- 586 9-5956
WILHELM HARLEY A
9-5554
WILHELM JOHANNES
9-7046
WILHELM RICHARD H
9-7053
WILHELMY ERNEST
9-1158
WILHITE R N
9-5629
WILK C R
9-6612
WILKE C R
9-3222
WILKHAMMER G A
9-4171
WILKINS J E JR
9-5173
WILKINS J ERNEST JR
9-2472
WILKINS J J
9-3656
WILKINSON D H
9- 363 9-3299 9-3645
9-7509
WILKINSON G
9-3096 9-4368 9-6220
9-6936 9-6937
WILKINSON JOSEPH R
9-6056 9-7126 9-7201
WILKINSON M K
9-2312 9-3218
WILKINSON PAUL R
9-4057 9-4094
WILKINSON ROGER G
9-1404 9-5047
WILKINSON W D
9-6659
WILLARD H B
9-7551
WILLARD HARVEY B
9-4596
WILLARD J E
9-5915
WILLARD JOHN E
9-7721
WILLGING J F
9-2255
WILLIAMS A J
9-1532 9-4804
WILLIAMS CHARLES N
9-2249
WILLIAMS CURTIS C
9-5314
WILLIAMS D D
9- 635 9-1466 9-4367
9-4702
WILLIAMS DALE G
9-2183
WILLIAMS E S
9-1046
WILLIAMS FLETCHER P JR
9-2553
WILLIAMS G I
9-3353 9-6944
WILLIAMS GORDON C
9-3380
WILLIAMS H J
9-1254 9-1903 9-1904
WILLIAMS J A
9-3790
WILLIAMS JOHN H
9-4301
WILLIAMS L H
9-5600
WILLIAMS M
9-3593
WILLIAMS M C
9- 801
WILLIAMS MARILYN H
9-7654
WILLIAMS P H
9-6679
WILLIAMS R
9-2624
WILLIAMS R A
9-4058
WILLIAMS R D
9-1851 9-4604
WILLIAMS R E
9-1838 9-1847
WILLIAMS ROBERT W
9-5487 9-5488
WILLIAMS RUSSELL R JR
9-5914
WILLIAMS T F
9-5895
WILLIAMS W B
9-6878 9-6879 9-7251
9-7270
WILLIAMS W LEE
9-3145 9-3168 9-3181
9-3859 9-4782 9-5941
9-6947 9-6948
WILLIAMSON ARTHUR E JR
9-2354 9-2357
WILLINGMAN MELVIN G
9-5549
WILLIS H H
9- 908 9-3427
WILLMORE TRACY A
9-4137 9-4139
WILLMOTT J C
9-4875 9-7914
WILLMS M
9-1716
WILLOUGHBY A B
9-6406
WILLOUGHBY G
9-1498
WILM DIEDERICH
9-7043
WILMS G R
9- 202
WILSKA SEPPO
9-2619
WILSON A S
9-2726
WILSON B G
9-6344
WILSON C W
9- 46
WILSON D J
9-4821
WILSON E BRIGHT JR
9-2436
WILSON E E
9- 702
WILSON E J
9-4511 9-5638
WILSON G ELIZABETH
9-3795
WILSON H W
9-7200
WILSON HERBERT B
9-1731
WILSON J G
9-2364 9-4833 9-7883
WILSON J WALTER
9-5229
WILSON JAMES E
9-6826
WILSON M KENT
9- 944 9-3080 9-5902
WILSON P R
9-5516 9-5519
WILSON R
9-5517 9-7146
WILSON R R
9-1442
WILSON RICHARD
9-6457
WILTSHIRE L L
9-3721
WILZBACH K E
9- 341 9-3057
WINAND L
9-2810 9-2858
WINCKLER J R
9-5429
WIND G
9-2862
WINDERS G R
9- 554 9- 558 9- 931
WINDING C C
9-3132
WING A B
9-1945 9-6348
WING JAMES
9-4852

WINHOLD E J
9-4577
WINKELMANN ALBERT
9-2782
WINKLER O
9- 195
WINKLER W
9-1667
WINOGRADZKI ANATOLE
9-5675
WINSBERG LESTER
9-1057
WINSCHE W E
9-7984
WINSLOW G
9-5250
WINSLOW G H
9-5907 9-7712
WINSLOW GEORGE H
9-1125 9-2949
WINSLOW GUY
9-7275
WINSTON A
9-2882
WINSTON R E
9-3138
WINTER J
9-4186
WINTER J A
9-3755
WINTER JACQUES
9- 366
WINTER ROLF G
9-6124
WINTERINGHAM F P W
9-3263
WINTERS PAUL N
9-1047
WINTERSTEIGER V
9- 435
WINTERSTEIGER VELJKO Z
9-1072 9-1664 9-5183
WINTHER AAGE
9-6533
WINZELER H
9-4542
WIRTH HENRY
9-6369
WIRTH HENRY E
9-4700
WIRTZ K
9-3640
WISE B
9-4764
WISEMAN CARL D
9-3521 9-5062 9-5604
WISER H L
9-4337
WITHINGTON C F
9-4151
WITT F E L
9-7947
WITTE H
9-4391
WITTELS M C
9-2831
WITTEMAN WILLARD G
9-5625
WITTEN VICTOR H
9- 836 9-5856 9-6553
WITTENBERG LAYTON
9-5910
WITTKE J P
9- 434
WITTRY DAVID B
9-3992
WITTWER S H
9- 9
WLODEK STANLEY T
9-4162
WODINSKY ISIDORE
9-1178
WOHLAUER GABRIELE
9-2138 9-7791
WOHLLEBEN K
9-6803
WOLF K L
9-7047
WOLFE B
9-5443 9-6018
WOLFE R A
9-1430 9-1550
WOLFEL E
9-4391
WOLFENDALE A W
9- 326
WOLFENSTEIN L
9-1660 9-4605
WOLFF JAY R
9-1031
WOLFF JOAN
9-5575 9-6636
WOLFF RUSSELL H
9- 147
WOLFF SHELDON
9- 942 9-6160
WOLFGAND R L
9-6074
WOLFGANG RICHARD
9-4759
WOLFROM M L
9-7734
WOLFSBERG MAX
9-1682 9-4957 9-5198
9-6894 9-7886
WOLLAN E O
9-1067 9-3344
WOLLMAN SEYMOUR H
9-1178 9-2543
WOLPERS C
9-1707
WOLSTENHOLME B
9-2196
WOLTERS G F
9-4533
WONG J B
9-3558
WONG JAMES
9-1527
WOOD D F
9-1198
WOOD D S
9- 634
WOOD E
9-3697
WOOD EUNICE M
9-7631
WOOD F W
9-4167 9-6660 9-7344
WOOD H B
9-6272
WOOD JOHN H
9- 516 9- 598
WOOD M R
9- 696
WOOD R E
9-4356
WOOD SCOTT E
9-1220 9-1221
WOOD WILLIAM W
9- 993
WOODFIELD F W
9- 588
WOODFORD HUGH J
9-5165
WOODGATE G K
9-7116
WOODRUFF L V
9-2027 9-2030
WOODS W W
9-2690 9-6333
WOODWARD E C
9- 458
WOODWARD J J
9-2479 9-2480
WOODWARD KENT T
9-5836
WOODWARD L A
9-1137
WOODWARD LEROY A
9-6246
WOODWARD V W
9- 475
WOOLF A A
9-2158 9-2187 9-3415
9-3416
WOOLLEY HAROLD W
9-7440
WOOLLEY R L
9-2771
WOOTEN A D
9-5002
WORD ELIZABETH L
9-5580
WORK GEORGE A
9-5425
WORK LINCOLN T
9-3232
WORKMAN B J
9-1103 9-2026
WORLOCK R M
9-6015
WORMALL A
9- 510 9-3379
WORNER H W
9-2766
WORSHAM R E
9-7945
WORSNOP B R
9-2128
WORTHAM J
9-1463 9-1464
WORTHAM JAMES T
9-5477
WORTHINGTON R E
9-2189
WOTRING A W
9-1236
WOUTERS L
9-1320
WOUTERS LOUIS F
9-7071
WREGE E E
9-6877 9-6878 9-6879
9-7257 9-7270
WRIGHT B T
9-6775 9-8004
WRIGHT C A M
9-1435
WRIGHT C C
9-6214 9-6215
WRIGHT D J
9- 892 9-1272
WRIGHT DOROTHY J
9- 239 9- 240 9- 241
WRIGHT G T
9- 707 9-1605
WRIGHT HAROLD D
9- 621 9-1626 9-3461
WRIGHT I F
9-2964
WRIGHT K A
9-1368
WRIGHT MARY D
9-1808
WRIGHT ROBERT J
9-6273
WRIGHT ROBERT W
9-3253 9-7480
WRIGHT W B JR
9-7297 9-7310 9-7696
WRUCK DONALD A
9-4467
WU C S
9-5475 9-5818 9-7574
WU TA-YOU
9-2361
WUCHER M J
9-6438
WULFF JOHN
9-1527 9-3457 9-4168
WUORINEN JOHN
9-7445
WYARD S J
9-4686 9-7572
WYCKOFF H O
9-3373
WYLD H W JR
9-1662 9-7088
WYLER E N
9- 976 9-2722
WYLIE R D
9- 939
WYLY L D
9-4498 9-5809
WYMAN LELAND C
9- 22

XAVIER J
9-7705

YADAV H N
9-4613
YAFFE L
9- 467 9-1613 9-3603
9-4527 9-6764
YAGGEE F L
9-5945
YAGODA HERMAN
9-3592 9-4220 9-4256
YAKEL HARRY L JR
9-6350
YAKIMOV M A
9-7939
YAKOVLEV YU V
9-7936
YAKOVLEVA E S
9-7834
YAKUTOVICH M V
9-7834
YALOW A AARON
9-1178
YAMADA MASAMI
9-5754 9-5819
YAMAGUCHI SHIGETO
9-6306
YAMAGUCHI YOSHIO
9- 405 9-4327 9-7977
YAMAMOTO ALBERT S
9-3517
YAMANOUCHI TAIJI
9-7204
YAMASAKI FUMIO
9-6648
YAMATERA HIDEO
9- 93
YAMAZAKI MIWAE
9-4650
YANAGIHARA TADASHI
9-4193
YANITZKAYA M E
9-7394
YANKEE W R
9-1263
YANKOV G B
9-5169 9-5511
YANKWICH PETER E
9- 871 9- 900 9-4404
9-6868

YANOSHI I L
9-1919
YANUSHKOVSKII V A
9-7806
YARNELL RICHARD A
9- 25
YASAITIS E L
9-1778
YASHIN N M
9-5146
YASIN M
9- 724 9-5132
YAVOR S R
9-5402
YEAGER ERNEST
9-5053
YEARIAN H J
9- 949
YEIVIN YEHUDAH
9-3269
YEKUTIELI G
9-6753 9-7474
YEN C S
9-6641
YERGIN PAUL F
9-5481
YERKOVICH L A
9-3503 9-3504 9-4793
9-5361
YNTEMA J L
9-2485
YOCKEY H P
9- 430
YOCOM J E
9-1796 9-1799 9-1800
9-1801
YODH G B
9-4545
YODH GAURANG B
9-5458
YOE JOHN H
9-4734
YOKOBORI TAKEO
9-4814
YOKOI KEI
9-5748
YONEMITSU M
9-4522
YONTS O C
9-2794 9-5632
YORK CARL M JR
9-1607
YOSHIDA SHIRO
9-1690 9-4647
YOSHIKAWA SADAE
9-2002
YOSHIMURA KIYOSHI
9-3765
YOSHIMURA TETZ
9-7543
YOSHIMURA Y
9-5942
YOSHIZAWA S R
9-5251
YOUDEN W J
9-1130
YOUNG A P
9-3863
YOUNG D J
9-2981
YOUNG D M
9-2677 9-4245
YOUNG GIFFORD A
9-5360 9-7028
YOUNG J A
9-4951
YOUNG J E R
9-1670
YOUNG S A
9- 792
YOUNG V E
9-2764
YPSILANTIS T
9- 789 9-4607
YUAN LUKE C L
9-4248 9-4585 9-6011
YUASA T
9- 807 9-7918
YUASA TOSIKO
9-2080 9-2959 9-2963
YUE A S
9-3420
YUKAWA JIRO
9-7976
YUNKER R
9-5581
YUREV V V
9-6079 9-6769
YURKOV V A
9-1869 9-7359
YUSTER PHILIP H
9-5786 9-5811
YUTLANDOV I A
9-7439 9-7939
YUTSIS A P
9-2086 9-2087

ZABETAKIS M G
9-7351
ZABIELSKI CHESTER
9- 598
ZACHARIASEN W H
9- 848 9- 904 9-2225
9-2226 9-2227 9-2372
9-3802 9-6351
ZAFFARANO D J
9-1037 9-1121 9-1680
9-2951 9-3242 9-5406
9-6484
ZAIDES A L
9-7225
ZAIISEV G A
9-7599
ZAITSEVA I N
9-7286
ZAKHAROVA N I
9-7657
ZAKHAROVA V M
9-6359
ZAKHAROVA V P
9-7932
ZALENSKII O V
9-7658
ZALKIN ALLAN
9-6665 9-7273
ZALKIND TS I
9-6190
ZAMCHALOVA E A
9-6426 9-7488
ZAND ROBERT
9-4958
ZANDBERG E YA
9-2933 9-6785
ZAPFFE CARL A
9- 963
ZAPP KARL HEINZ
9-1273
ZAPPA L
9- 387 9-1615 9-2965
9-4628 9 5734 9 6522
ZARESKI GORDON K
9-1513
ZARUBIN P P
9-2068 9-2069
ZARZYCKI JERZY
9-7435
ZASLAVSKII YU S
9-5943 9-7742
ZATSEPIN G T
9-2366
ZATSEPINA G N
9-7933
ZAUKELIES D A
9- 662 9-2130
ZAUN BARBARA D
9-4661
ZAVARZINA N B
9-3358
ZAVITSANOS PETROS
9-7676
ZAVODNAYA G V
9-7287
ZAVOISKII E K
9-2860 9-4248
ZAVOISKII V K
9-7797
ZAYAN S EL-DIN
9-2686
ZEEK W C
9-4930
ZELDES HENRY
9-1687
ZELDOVICH YA B
9-6805
ZELLER H D
9-5332 9-5333 9-5334
9-5336
ZELLER HOWARD D
9-2263 9-3466
ZENGER JERRY H
9-3936
ZENKOVA L N
9-7315

ZHABROVA G M
9-7321
ZHARKOV G F
9- 722 9-2084
ZHARKOV V N
9-6096
ZHDANOV A P
9-3559
ZHDANOV G B
9-1920 9-7831
ZHDANOVA K I
9-6207
ZHEMKOVA Z P
9-5208
ZHEZBEL N G
9-7619
ZHUKHOVITSKII A A
9-5670 9-7374 9-7394
9-7795 9-7802
ZHUKOVSKII N N
9-1970
ZHVANKO YU N
9-1933
ZICK LEONARD P
9-7365
ZIEGLAR D L
9-5329
ZIEGLER N F
9-7945
ZIEMKE PAUL C
9-6649
ZIGMAN P E
9- 658
ZIJP W L
9-1126
ZILBERMAN G E
9-1574
ZIMMERLUND G
9-3766
ZIMMERMAN E J
9-1394 9-7179
ZIMMERMAN J
9-5266
ZIMMERMAN J B
9-7293
ZIMMERMAN S F
9- 739
ZIMMERMANN H J
9- 652 9-4210 9-7033
ZINDLER G F
9-1951
ZINN T L
9-7056
ZINN W H
9-1357 9-6010 9-6011
ZIRIN HAROLD
9-3995
ZISMAN W A
9-6596
ZNOIKO A P
9-6909
ZOBEL W
9-3262
ZOEPPRITZ U
9-6586
ZOLINA Z K
9-5278
ZOLOTAVIN A V
9-5725
ZOMBKOVSKII S M
9-2935 9-4891
ZOMLEFER JACK
9-4707
ZORN G T
9-4494 9-5744 9-5780
ZUBER NOVAK
9- 936
ZUBLER EDWARD G
9-5914
ZUCKER A
9- 421 9-1648 9-1649
9-4498 9-7948
ZUCKER EVA F
9-1151
ZUKRIEGELOVA MARIE
9- 535
ZVANUT A
9- 220
ZWEIFEL P F
9- 417 9-1674 9-2927
ZWEIG GUNTER
9-3076
ZWIKKER CORNELIS
9-2338
ZWOLINSKI BRUNO J
9-6892
ZYZES F C
9- 154 9-1822

CORPORATE AUTHOR INDEX

Separate personal and corporate author indexes are provided in this issue.
The personal author index immediately precedes this index.

For each reference the number followed by a colon is the volume number, and the numbers following are the abstract numbers.

A

Admiralty Centre for Scientific Information and Liaison, London, England.
See Gt. Brit. Admiralty Centre for Scientific Information and Liaison, London.

Aerojet General Corp., Azusa, Calif., 9: 6867

Aeronautical Engineering Lab., Princeton Univ.
See Princeton Univ., N. J. Aeronautical Engineering Lab.

Aeronautical Materials Lab., Naval Air Experimental Station, Philadelphia.
See Naval Air Experimental Station. Aeronautical Materials Lab., Philadelphia.

Aeroprojects, Inc., West Chester, Penna., 9: 2725, 5065, 5352

Air Cleaning Lab., Harvard Univ. School of Public Health.
See Harvard Univ., Boston. Air Cleaning Lab.

Air Force, Washington, D. C., 9: 4847

Air Force Radiation Lab., Univ. of Chicago.
See Chicago. Univ. Air Force Radiation Lab.

Alabama. Univ., Tuscaloosa., 9: 1555

Alfred Univ., Alfred, N. Y., 9: 4780

Allegheny Ludlum Steel Corp., Brackenridge, Penna., 9: 2273, 3488, 3869

Allegheny Ludlum Steel Corp. Research Lab., Watervliet., N. Y., 9: 2720

Allison Div. Materials Lab., General Motors Corp., Indianapolis., 9: 1840

Aluminum Co. of America. Aluminum Research Labs., New Kensington, Penna., 9: 1743

American Cyanamid Co. Atomic Energy Div. Raw Materials Development Lab., Winchester, Mass., 9: 4146, 6619

American Cyanamid Co. Atomic Energy Div., Watertown, Mass., 9: 159, 6865

American Electro Metal Corp., Yonkers, N. Y., 9: 150, 2703, 2740, 3165, 3485, 3841, 3850, 4791, 4992, 5643, 5654, 7326

American Lava Corp., Chattanooga., 9: 4138

American Meat Inst. Foundation, Chicago., 9: 10

Ames Aeronautical Lab., Moffett Field. Calif., 9: 3915

Ames Lab., Ames, Iowa., 9: 169, 586, 802, 851, 875, 931 989, 1036, 1037, 1121, 1212, 1213, 1219, 1247, 1302, 1481, 1599, 1759, 1760, 1790, 1994, 2022, 2023, 2133, 2382, 2726, 2788, 2821, 2951, 3052, 3053, 3170, 3242, 3444, 3805, 4091, 4266, 4421, 4949, 4967, 4970, 5110, 5406, 5618, 5621, 5681, 5755, 5956, 6178, 6484, 6609, 6624, 6625, 6626, 7105, 7106, 7166, 7258, 7726

Amherst Coll., Mass., 9: 2677

Applied Mathematics and Statistics Lab., Stanford, Univ.
See Stanford Univ., Calif. Applied Mathematics and Statistics Lab.

Arcos Corp., Philadelphia., 9: 1860, 2734

Argonne Cancer Research Hospital, Chicago., 9: 3748, 7253

Argonne National Lab., Lemont, Ill., 9: 3, 127, 340, 434, 608, 618, 817, 925, 930, 988, 1231, 1804, 2500, 2538, 2539, 2547, 2691, 2949, 3501, 3786, 4074, 4237, 4477, 4911, 4978, 5646, 6204, 6236, 6237, 6254, 6633, 6659, 6704, 6748, 6767, 6820, 6868, 6945, 6946, 6991, 7095, 7692, 7981

Arizona. Univ., Tucson., 9: 5347

Arkansas. Univ., Fayetteville. Coll. of Arts and Sciences., 9: 4101

Arkansas. Univ., Fayetteville. Engineering Experiment Station., 9: 1578, 1579, 3918, 3919, 6193

Armed Services Technical Information Agency Reference Center, Library of Congress, Washington, D. C., 9: 2535

Army Medical Research Lab., Fort Knox, Ky., 9: 4357, 4664, 4679, 4690, 5570, 6565, 6824, 7229, 7230, 7610 7693

Arnold Engineering Development Center, Tullahoma, Tenn., 9: 4476

Atomic Energy Commission, Washington, D. C., 9: 6187, 6474, 6475, 6476, 6479, 6664

Atomic Energy Medical Research Project, Western Reserve Univ.
See Western Reserve Univ., Cleveland. Atomic Energy Medical Research Project.

Atomic Energy of Canada Ltd. Chalk River Project, Chalk River, Ont., 9: 4383, 4490, 4908, 5108, 5203, 6399, 6402, 6477, 6502, 6606, 6686, 6705, 6921, 7386, 7493, 7921, 7922, 7923

Atomic Energy Project, Canada.
See National Research Council of Canada. Atomic Energy Project, Chalk River, Ont.

Atomic Energy Project, Univ. of California, Los Angeles.
See California. Univ., Los Angeles. Atomic Energy Project.

Atomic Energy Project, Univ. of Rochester.
See Rochester, N. Y. Univ. Atomic Energy Project.

Atomic Energy Research Establishment, Harwell, Berks, England.
See Gt. Brit. Atomic Energy Research Establishment, Harwell, Berks, England.

Atomic Weapons Research Establishment, Aldermaston, Berks, England.
See Gt. Brit. Atomic Weapons Research Establishment, Aldermaston, Berks, England.

Australia. Radiophysics Lab., Chippendale, New South Wales., 9: 2409, 2410

B

Babcock and Wilcox Co., New York., 9: 939
Babcock and Wilcox Co. Works Control Lab., Barberton, Ohio., 9: 632, 939
Baldwin-Lima Hamilton Corp., Philadelphia., 9: 7738
Ballistic Research Labs., Aberdeen Proving Ground, Md., 9: 1018, 4765, 6375
Bartol Research Foundation, Philadelphia., 9: 3989, 3993, 4204
Battelle Memorial Inst., Columbus, Ohio., 9: 173, 178, 633, 976, 1508, 1528, 1532, 1798, 1799, 1800, 1801, 1802, 1820, 1837, 1839, 1849, 1851, 1854, 1856, 1857, 2274, 2276, 2298, 2722, 2729, 3118, 3164, 3476, 3480, 3490, 3491, 3492, 3494, 3497, 3518, 3522, 3523, 3846, 3855, 3857, 3863, 4145, 4172, 4176, 4177, 4462, 4788, 4792, 4796, 4797, 4798, 4799, 4800, 4804, 4805, 4806, 5063, 5297, 5340, 5344, 5349, 5350, 5351, 5655, 5663, 5953, 6284, 6292, 6647, 6661, 6821, 7005, 7274, 7288, 7345
Battelle Memorial Inst. Titanium Metallurgical Lab., Columbus, Ohio., 9: 7354, 7355, 7356
Bausch and Lomb Optical Co., Rochester, N. Y., 9: 1040, 2051, 3932
Bettinger Corp., Waltham, Mass., 9: 6645
Birmingham. Univ., England., 9: 2738
Bjorksten Research Labs., Inc., Madison, Wis., 9: 191, 3181, 3182
Boeing Airplane Co., Seattle., 9: 2738, 4116, 4228
Bridgeport Brass Co., Conn., 9: 6992
Brigham Young Univ., Provo, Utah., 9: 5166
Bristol Aeroplane Co., Ltd., England., 9: 2737
Brookhaven National Lab., Upton, N. Y., 9: 475, 476, 695, 726, 1154, 1155, 1211, 1234, 1315, 1366, 1416, 1417, 1597, 1781, 1962, 1963, 2099, 2413, 2692, 2787, 2840, 3004, 3120, 3285, 3975, 4038, 4039, 4042, 4044, 4100, 4207, 4216, 5138, 5206, 5245, 5419, 5493, 5598, 5762, 5815, 6131, 6173, 6177, 6227, 6400, 6401, 6636, 6777, 7060, 7068, 7289, 7290, 7530, 7755
Brookhaven National Lab. Neutron Cross Section Compilation Group, Upton, N. Y., 9: 7096
Brooklyn. Polytechnic Inst., 9: 116, 1182, 1912, 3888, 3889, 4211, 4768, 4958, 6996
Brooklyn. Polytechnic Inst. Polymer Research Inst., 9: 4971
Brown Univ., Providence., 9: 6701
Brown Univ., Providence. Barus Research Lab. of Physics., 9: 7788
Brown Univ., Providence. Metals Research Lab., 9: 5189
Brush Labs. Co., Cleveland., 9: 3496, 4141, 4993
Brussels. Universite. Centre de Physique Nucleaire., 9: 2707, 2851, 2852, 2853, 2913, 2928
Buffalo. Univ., 9: 91, 262, 2614, 2615
Bureau of Mines., 9: 2724, 3858, 4167, 6283, 6660, 7332, 7344
Bureau of Mines, Albany, Oreg., 9: 6289
Bureau of Mines. Eastern Experimental Station, College Park, Md., 9: 1895
Bureau of Mines. Fuels Technology Div., Pittsburgh., 9: 4126
Bureau of Ships., 9: 6664
Burns and Roe, Inc., New York., 9: 6597

C

California Inst. of Tech., Pasadena., 9: 1133, 2785, 4208, 5992, 7739
California Inst. of Tech., Pasadena. Dynamic Properties Lab., 9: 634
California Inst. of Tech., Pasadena. Jet Propulsion Lab., 9: 75, 630, 2281, 4129
California Inst. of Tech., Pasadena. Norman Bridge Lab. of Physics.. 9: 4333
California Inst. of Tech., Pasadena. Physical Metallurgy Lab., 9: 5055
California Research and Development Co. Livermore Research Lab., Livermore, Calif., 9: 144, 370, 774, 799, 7292
California. Univ., Berkeley., 9: 4061, 4184, 4432, 5062, 5664, 7502
California. Univ., Berkeley. Crocker Lab., 9: 3574, 3575, 3576
California. Univ., Berkeley. Donner Lab., 9: 7249, 7250
California. Univ., Berkeley. Inst. of Engineering Research., 9: 650, 3521, 4230, 4430, 4431, 6951
California. Univ., Berkeley. Microwave Lab., 9: 5704
California. Univ., Berkeley. Minerals Research Lab., 9: 183, 970, 2732, 2733, 3172, 4178, 5358, 5961, 6646
California. Univ., Berkeley. Radiation Lab., 9: 48, 59, 60, 61, 102, 107, 117, 123, 304, 305, 306, 377, 378, 395, 402, 449, 506, 657, 735, 736, 760, 773, 778, 1446, 1456, 1477, 1480, 1644, 1645, 1688, 1689, 1712, 1863, 2136, 2137, 2195, 2197, 2198, 2218, 2411, 2416, 2437, 2465, 2474, 2540, 2551, 2608, 2609, 2890, 2914, 2929, 2930, 2990, 3009, 3048, 3071, 3089, 3253, 3357, 3364, 3377, 3442, 3662, 3663, 3664, 3730, 3778, 3954, 3966, 4212, 4245, 4363, 4499, 4517, 4704, 4705, 4726, 4742, 4859, 4860, 4863, 4864, 4872, 4873, 4885, 4912, 4929, 4973, 5079, 5080, 5114, 5115, 5116, 5129, 5167, 5210, 5289, 5303, 5304, 5407, 5450, 5509, 5510, 5569, 5571, 5586, 5587, 5588, 5627, 5697, 5783, 5835, 5839, 5933, 5991, 6035, 6069, 6094, 6132, 6219, 6334, 6378, 6379, 6495, 6496, 6511, 6563, 6710, 6778, 6784, 6863, 6880, 6900, 6911, 7063, 7107, 7167, 7185, 7224, 7231, 7232, 7249, 7250, 7272, 7296, 7387, 7388, 7418, 7433, 7446, 7606, 7642, 7653, 7654, 7675, 7676, 7733, 7824, 7903
California. Univ., Livermore. Radiation Lab., 9: 2634, 3055, 3446, 3936, 4025, 4246, 4286, 4300, 4386, 4413, 4509, 4763, 4843, 5249, 5280, 5391, 6335, 6599, 6665, 6881, 7071, 7098, 7273, 7455, 7856
California. Univ., Los Angeles., 9: 936, 1033, 2335, 2470, 4056
California. Univ., Los Angeles. Atomic Energy Project., 9: 37, 106, 700, 701, 846, 1042, 1462, 1488, 1764, 1966, 2164, 2334, 2550, 3005, 3033, 3753, 4056, 4344, 4415, 4762, 4849, 5838, 5869, 6629, 6899
California. Univ., San Francisco. School of Medicine. Radiological Lab., 9: 1723, 6155
Callery Chemical Co., Penna., 9: 51, 52, 98, 596, 2131, 2132, 2161, 2613, 2679, 3756, 4059, 4378, 4379, 5873
Camin Labs., Inc., Brooklyn., 9: 3495
Canada. Armament Research and Development Establishment, Valcartier, Que., 9: 4841
Canada. Defence Research Northern Lab., Fort Churchill, Manitoba., 9: 1581
Canada. Dept. of Mines and Technical Surveys., 9: 878, 1944, 2242, 2260, 2261, 4516
Canada. Dept. of Mines and Technical Surveys. Mines Branch., 9: 4996, 5112, 6650, 7293, 7294, 7736
Canada. Experimental Station, Suffield, Alberta., 9: 5705, 7432
Canada. Ontario Research Foundation., 9: 2238
Carbide and Carbon Chemicals Co. K-25 Plant, Oak Ridge, Tenn., 9: 898, 2789, 2838, 3213, 3410, 3445, 4396, 5931, 6634, 7821
Carbide and Carbon Chemicals Co. Y-12 Plant, Oak Ridge, Tenn., 9: 1961, 7297, 7310, 7696
Carnegie Inst. of Tech., Pittsburgh. Metals Research Lab., 9: 1467, 2135, 4437, 6286, 7269

Carnegie Inst. of Tech., Pittsburgh., 9: 232, 654, 776, 777, 800, 971, 977, 1108, 1271, 1533, 3171, 5077, 5789, 6501
Carnegie Inst. of Tech., Pittsburgh. Lab. for Magnetics Research., 9: 4209
Carnegie Institution of Washington, D. C., 9: 354
Case Inst. of Tech., Cleveland., 9: 967, 1848, 2285, 3458, 4994, 5666, 6261, 6998, 7754
Case Inst. of Tech., Cleveland. Metals Research Lab., 9: 181
Catalytic Construction Co., Philadelphia., 9: 5623
Centre de Physique Nucleaire, de L' Université Libre de Bruxelles.
See Brussels. Université. Centre de Physique Nucleaire.
Chalk River Project, Canada.
See National Research Council of Canada. Atomic Energy Project, Chalk River, Ont.
Chemical and Radiological Labs., Army Chemical Center, Md., 9: 3923, 4884, 5722
Chemical Corps Biological Labs., Camp Detrick, Md., 9: 4488
Chemical Corps, Camp Detrick, Md., 9: 4041
Chemical Corps Medical Labs., Army Chemical Center, Md., 9: 844, 914, 3069, 3359, 3360, 4054
Chemical Research Lab., Metal Hydrides Inc.
See Metal Hydrides Inc. Chemical Research Lab., Beverly, Mass.
Chicago Development Corp., Riverdale, Md., 9: 4107
Chicago. Univ., 9: 13, 14, 3728, 3729
Chicago. Univ. Air Force Radiation Lab., 9: 13, 14, 480, 2548, 3728, 3729, 4665, 6154, 6826
Chicago. Univ. Inst. for Nuclear Studies., 9: 1598
Chicago. Univ. Inst. for the Study of Metals., 9: 2741
Chicago. Univ. Lab. of Molecular Structure and Spectra., 9: 4239
Chicago. Univ. Metallurgical Lab., 9: 7325, 7342
Cincinnati. Univ., 9: 3386
Clevite Research Center, Cleveland., 9: 7785
Clinton Labs., Oak Ridge, Tenn., 9: 7066
Cobb Chemical Lab., Univ. of Va.
See Virginia. Univ., Charlottesville. Cobb Chemical Lab.
College of Aeronautics, Cranfield, Bucks, England., 9: 4168
Colorado. Univ., Boulder., 9: 3759
Colorado. Univ., Boulder. Engineering Experiment Station., 9: 289
Columbia Univ., Irvington-on-Hudson, N. Y. Nevis Cyclotron Labs., 9: 775, 4253, 4254, 5426, 5448, 5449, 5739
Columbia Univ., New York., 9: 5, 531, 1590, 2706, 2787, 3826, 4998, 5937, 6228, 6876, 7536
Columbia Univ., New York. Coll. of Physicians and Surgeons., 9: 16
Columbia Univ., New York. Columbia Radiation Lab., 9: 731, 6437, 6807
Columbia Univ., New York. Div. of War Research., 9: 7316, 7317
Columbia Univ., New York. Electronics Research Labs., 9: 7445
Columbia Univ., New York. Nuclear Physics Labs., 9: 3965, 6751
Columbia Univ., New York. Radiological Lab., 9: 820
Columbia Univ., New York. School of Engineering., 9: 4460, 5054, 5056, 7391
Columbia Univ., New York. School of Mines., 9: 1269, 1861
Commonwealth Engineering Co. of Ohio, Dayton, Ohio., 9: 5955, 6280, 6281
Computation Lab., Wayne Univ.
See Wayne Univ., Detroit. Computation Lab.
Connecticut. Univ., Storrs., 9: 2613, 6554
Consolidated Vultee Aircraft Corp., Fort Worth, Tex., 9: 1103, 1104, 1316, 1375, 2027, 2028, 2029, 2030, 2926, 3252, 3924, 4114, 6063, 6093, 6403, 6500, 6508, 7853
Continental Oil Co. Central Research Labs., Ponca City, Okla., 9: 6333
Continental Oil Co., Ponca City, Okla., 9: 2690
Cook Electric Co. Cook Research Labs. Div., Skokie, Ill., 9: 3547
Cornell Aeronautical Lab., Inc., Buffalo., 9: 3167, 3502, 3503, 3504, 3505, 3506, 3519, 4793, 5064, 5361
Cornell Univ., Ithaca, N. Y., 9: 186, 4121, 6211, 6874, 7059
Cornell Univ., Ithaca, N. Y. Floyd Newman Lab. of Nuclear Studies., 9: 693
Cornell Univ., Ithaca, N. Y. Graduate School of Aeronautical Engineering., 9: 177
Crane Co., Chicago., 9: 1858, 3176, 5659, 7350
Crocker Lab., Univ. of California.
See California. Univ., Berkeley. Crocker Lab.
Cruft Lab., Harvard Univ.
See Harvard Univ., Cambridge, Mass. Cruft Lab.
Cryogenic Lab., Ohio State Univ.
See Ohio State Univ., Columbus. Cryogenic Lab.
Curtiss-Wright Corp. Wright Aeronautical Div., Wood-Ridge, N. J., 9: 4807

D

David Sarnoff Research Center, Princeton, N. J., 9: 1580, 1893, 3208, 3251, 6372, 7427
David W. Taylor Model Basin, Carderock, Md., 9: 3068, 3439, 6244
Defence Research Northern Lab., Canada.
See Canada. Defence Research Northern Lab., Fort Churchill, Manitoba.
Delaware. Univ., Newark., 9: 475, 3891, 7259, 7260
Denver. Univ. Denver Research Inst., 9: 6181
Department of Mines and Technical Surveys, Mines Branch, Canada.
See Canada. Dept. of Mines and Technical Surveys.
Detroit Arsenal, Centerline, Mich., 9: 3140
Detroit. Univ., 9: 3140
Digital Computer Lab. Mass. Inst. of Tech.
See Massachusetts Inst. of Tech., Cambridge. Digital Computer Lab.
Distillation Products, Inc., Rochester, N. Y., 9: 4241, 4242
Division of Production, AEC., 9: 79
Division of Atomic Energy (Production), Research and Development Branch, Windscale, England.
See Gt. Brit. Windscale Works, Sellafield, Cumb., England.
Division of Raw Materials, AEC., 9: 161, 1257, 2708, 3154, 6963, 6964, 7335
Division of Raw Materials. Denver Exploration Branch, AEC., 9: 7333, 7757, 7758
Division of Raw Materials. Salt Lake Exploration Branch, AEC., 9: 5324, 5325, 6652, 7334, 7759
Division of Reactor Development, AEC., 9: 7957
Douglas Aircraft Co., Inc., Santa Monica, Calif., 9: 6641
Dow Chemical Co., Midland, Mich., 9: 192, 1270, 3870
Dow Chemical Co. Metallurgical Labs., Midland, Mich., 9: 1852, 2277, 2278, 3840, 3852, 4160, 4161, 5050, 5051, 5342, 5652
Dow Chemical Co. Western Div., Pittsburg, Calif., 9: 5622, 6942
Dow Corning Corp., Midland, Mich., 9: 1767, 4954, 7709

Du Pont de Nemours (E. I.) and Co. Atomic Energy Div., Wilmington, Del., 9: 153, 298, 1196, 1596, 1598, 1942, 2194, 2725, 3925, 3926, 4229
Du Pont de Nemours (E. I.) and Co. Savannah River Lab., Augusta, Ga., 9: 4845, 5352, 6064, 7065, 7854
Dublin Inst. for Advanced Studies. School of Cosmic Physics., 9: 699
Dugway Proving Ground, Tooele, Utah., 9: 6404
Duke Univ., Durham, N. C., 9: 890, 1134, 4332
Dynamic Electronics-New York, Inc., Glendale, N. Y., 9: 5095
Dynamic Properties Lab., California Inst. of Tech.
See California Inst. of Tech., Pasadena. Dynamic Properties Lab.

E

Edgerton, Germeshausen and Grier, Inc., Boston., 9: 5529
Engineering Research Inst. Univ. of Mich.
See Michigan. Univ., Ann Arbor. Engineering Research Inst.
European Council for Nuclear Research, Geneva., 9: 353, 388, 389, 390, 391, 392, 393, 770, 771, 1019, 1098, 1099, 1100, 1101, 1367, 1652, 2414, 2433, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2501, 2502, 2503, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2923, 7162, 7163
European Organization for Nuclear Research, Geneva., 9: 3577, 3661, 4295, 4296, 4297, 4298, 4478, 4513, 4539, 4580, 4581, 4582, 4660, 4910, 5162, 5163, 5164, 6084, 6085, 6376, 6493, 6494, 7069, 7202, 7557
European Organization for Nuclear Research, Geneva. Proton Synchrotron Group., 9: 7164, 7165
European Organization for Nuclear Research, Geneva. Synchro-Cyclotron Div., 9: 3306

F

Fairchild Camera and Instrument Corp. Potentiometer Div., Hicksville, N. Y., 9: 5074
Fairchild Engine and Airplane Corp. NEPA Div., Oak Ridge, Tenn., 9: 174, 600
Fansteel Metallurgical Corp., North Chicago, Ill., 9: 174
Firth Sterling, Inc., Pittsburgh., 9: 4991
Florida. Univ., Gainesville., 9: 4951
Florida. Univ., Gainesville. Engineering and Industrial Experiment Station., 9: 2471
Floyd Newman Lab. of Nuclear Studies, Cornell Univ.
See Cornell Univ., Ithaca, N. Y. Floyd Newman Lab. of Nuclear Studies.
Fluid Motion Sub-Committee, Aeronautical Research Council, Great Britain.
See Gt. Brit. Aeronautical Research Council. Fluid Motion Sub-Committee.
Food Research Inst., Chicago., 9: 474
Foote Mineral Co., Philadelphia., 9: 1853
Fordham Univ., New York., 9: 3153, 5814
Forrestal Research Center, Princeton Univ.
See Princeton Univ., N. J. Forrestal Research Center.
France. Commissariat À l' Énergie Atomique, Paris., 9: 6962, 6993, 7021, 7036, 7044, 7055, 7442, 7570, 7902
Frankford Arsenal. Fire Control Lab., Philadelphia., 9: 4930
Frankford Arsenal. Pitman-Dunn Labs., Philadelphia., 9: 1197, 2632, 3509, 3847, 4942, 5346, 5957
Franklin Inst. Labs. for Research and Development, Philadelphia,, 9: 1855, 1862, 3174, 7001, 7823

G

General Electric Co. Aircraft Nuclear Propulsion Project, Cincinnati., 9: 2700, 2983, 4986
General Electric Co. General Engineering Lab., Schenectady, N. Y., 9: 167, 272, 609, 1263, 3288, 5113, 7722
General Electric Co. Research Lab., Schenectady, N. Y., 9: 5058, 5662, 6086, 6195, 7352, 7353, 7558, 7674
General Electric Co. Thomson Lab., Lynn, Mass., 9: 968, 6662
General Mills, Inc., Minneapolis., 9: 3720
General Motors Corp. Research Labs. Div., Detroit,, 9: 4123
General Services Administration, Washington, D. C., 9: 6817
Geological Survey., 9: 78, 162, 880, 881, 1515, 2263, 2709, 3828, 4945, 5326, 6268, 6653
George Washington Carver Foundation, Tuskegee Institute, Ala., 9: 3799
Georgia Inst. of Tech., Atlanta. Engineering Experiment Station,, 9: 56, 1789, 3904, 4345, 6246
Goodrich (B. F.) Co. Research Center, Brecksville, Ohio,, 9: 6873
Grand Junction Operations Office, AEC, Colo., 9: 160, 624, 1256, 1512, 1513, 1828, 6651
Gt. Brit. Admiralty Centre for Scientific Information and Liaison, London,, 9: 2237, 7820
Gt. Brit. Aeronautical Research Council. Fluid Motion Sub-committee,, 9: 1803, 4764
Gt. Brit. Atomic Energy Research Establishment, Harwell, Berks, England,, 9: 74, 97, 170, 230, 269, 270, 294, 295, 296, 297, 694, 874, 906, 937, 1034, 1080, 1096, 1097, 1699, 2415, 2445, 3443, 3551, 3587, 3755, 3776, 3789, 3818, 3912, 3920, 3962, 3963, 3964, 3974, 3987, 3988, 4128, 4206, 4227, 4244, 4265, 4510, 4511, 4512, 4619, 4754, 4761, 4821, 4832, 4848, 4878, 4883, 5096, 5107, 5161, 6845, 6920, 7020, 7054, 7067, 7148, 7149, 7160, 7161, 7428, 7429, 7448, 7449, 7450, 7451, 7452, 7844, 7852
Gt. Brit. Atomic Weapons Research Establishment, Aldermaston, Berks, England,, 9: 35, 2631, 4659, 4948, 5886, 6260, 6352, 6373, 6374, 6637
Gt. Brit. Capenhurst Works, Capenhurst, Ches, England., 9: 3385, 3570, 3583, 3584, 4395
Gt. Brit. Culcheth Labs., Culcheth, Lancs, England,, 9: 1266, 1745, 2666, 4180, 4181, 6182, 7295
Gt. Brit. Ministry of Supply. Chemical Inspectorate, London., 9: 5599
Gt. Brit. Ministry of Supply. Technical Information Bureau,, 9: 2828, 2829
Gt. Brit. National Gas Turbine Establishment, Farnborough, Hants, England., 9: 5938
Gt. Brit. Royal Aircraft Establishment, Farnborough, Hants, England., 9: 1808, 4802, 4803, 7431, 7694
Gt. Brit. Springfields Works, Springfields, Lancs, England., 9: 4384, 4385
Gt. Brit. Windscale Works, Sellafield, Cumb, England., 9: 3514, 3515, 3746, 3760, 3777, 3790, 3815, 3864, 3933, 3934, 4231, 5990, 7695

H

Hanford Atomic Products Operation, Richland, Wash., 9: 5147, 5284, 5463, 5837, 6174, 6240, 7707, 7708
Hanford Works, Richland, Wash., 9: 12, 128, 299, 368, 400, 501, 549, 585, 609, 629, 696, 942, 1703, 2950, 3212, 3752, 3825, 3927

Harvard Univ., Boston. Air Cleaning Lab., 9: 932, 4831
Harvard Univ., Boston. Medical School Biophysical Lab., 9: 6173
Harvard Univ., Cambridge, Mass., 9: 914, 4368, 5398
Harvard Univ., Cambridge, Mass. Cruft Lab., 9: 2895
Health and Safety Lab., New York Operations Office, AEC.
See New York Operations Office. Health and Safety Lab., AEC.
High Energy Physics Lab., W. W. Hansen Labs. of Physics, Stanford Univ.
See Stanford Univ., Calif. High-Energy Physics Labs.
Holston Defense Corp., Kingsport, Tenn., 9: 4058
Hooker Electrochemical Co., Niagara Falls, N. Y., 9: 6188
Horizons, Inc., Cleveland., 9: 1859, 3455, 3477, 3845, 3848, 4182, 4183, 4943, 5658

I

Illinois Inst. of Tech., Chicago., 9: 532, 1741, 3890, 4480, 5357, 6279, 7784
Illinois Inst. of Tech., Chicago. Armour Research Foundation., 9: 180, 975, 978, 1530, 1534, 1841, 1842, 1843, 1844, 1845, 1850, 2293, 2386, 2719, 2721, 2728, 2736, 2945, 3166, 3475, 3481, 3484, 3486, 3489, 3493, 3499, 3516, 3517, 3520, 3524, 3849, 3851, 3853, 3854, 4104, 4418, 4789, 5076, 5343, 5665, 5720, 5964, 6282, 6997, 7000, 7004, 7357, 7787, 7789
Illinois. Univ., Urbana., 9: 615, 616, 934, 938, 1846, 2657, 3453, 3868, 4130, 4137, 4139, 4157, 4158, 4159, 4461, 4987, 5059, 5060, 5348, 5660, 5962, 6262, 6287, 6663
Illinois. Univ., Urbana. Electrical Engineering Research Lab., 9: 2786, 2885, 2886, 3175
Illinois. Univ., Urbana. Statistical Research Lab., 9: 2103, 5418
Indiana. Univ., Bloomington., 9: 2808, 3968
Industrial Hygiene Foundation of America, Inc., Pittsburgh., 9: 6171
Industrial Scientific Co., New York., 9: 3806
Industrial Test Lab., Philadelphia Naval Shipyard.
See Philadelphia Naval Shipyard. Industrial Test Lab.
Institut für Teoretish Fysik, Copenhagen, Denmark., 9: 2501, 2502
Institute for Nuclear Studies, Univ. of Chicago.
See Chicago. Univ. Inst. for Nuclear Studies
Institute for the Study of Metals, Univ. of Chicago.
See Chicago. Univ. Inst. for the Study of Metals.
Institute for the Study of Rate Processes, Univ. of Utah.
See Utah. Univ., Salt Lake City. Inst. for the Study of Rate Processes.
Institute of Engineering Research, Univ. of Calif., Berkeley.
See California. Univ., Berkeley. Inst. of Engineering Research.
Institute of Industrial Research, Syracuse Univ.
See Syracuse Univ., N. Y. Inst. of Industrial Research.
Institute of Industrial Research, Univ. of Louisville.
See Louisville, Ky. Univ. Inst. of Industrial Research.
Institute of Mathematical Sciences, New York Univ.
See New York Univ., New York. Inst. of Mathematical Sciences.
Institute of Research, Lehigh Univ.
See Lehigh Univ., Bethlehem, Penna. Inst. of Research.
Institute of Statistics, Univ. of N. C.
See North Carolina. Univ., Chapel Hill. Inst. of Statistics.
International Cooperation Administration. Office of Industrial Resources, Washington, D. C., 9: 7603
International Minerals and Chemical Corp., Chicago., 9: 5879, 5880, 5881, 5921, 6183, 6184, 6877, 6878, 6879, 7257, 7270, 7271, 7673
Ionosphere Research Lab., Pennsylvania State Univ.
See Pennsylvania State Univ., University Park. Ionosphere Research Lab.
Iowa State Coll.
See Ames Lab., Ames, Iowa.
Iowa. State Univ., Iowa City., 9: 5183
Isotopes Div., Radiological Safety Branch, AEC.
See Oak Ridge Operations Office. Isotopes Div., AEC.

J

Jacobs Aircraft Engine Co., Pottstown, Penna., 9: 3482
Jet Propulsion Lab., Calif. Inst. of Tech.
See California Inst. of Tech., Pasadena. Jet Propulsion Lab.
Johns Hopkins Univ., Baltimore., 9: 401, 1704, 2520, 2854, 4380
Johns Hopkins Univ., Baltimore. Thomas C. Jenkins Labs. of Biophysics., 9: 274
Johnston (Herrick L.) Inc., Columbus, Ohio., 9: 4118, 4119
Joint Establishment for Nuclear Energy Research, Kjeller, Norway., 9: 697, 749, 899, 3717, 3796, 3976, 4235, 6898

K

Kansas. Univ., Lawrence., 9: 2160, 3795, 5782, 7981
Kaiser Aluminum and Chemical Corp., Spokane., 9: 5354
Kentucky. Univ., Lexington. Kentucky Research Foundation., 9: 1836, 4790, 6263
Knolls Atomic Power Lab., Schenectady, N. Y., 9: 36, 154, 172, 272, 300, 369, 428, 819, 969, 1038, 1118, 1308, 1317, 1582, 1655, 1822, 2162, 2517, 2655, 2689, 2827, 2927, 3098, 3121, 3286, 3287, 4010, 4075, 4117, 4169, 4514, 4564, 4822, 4846, 4959, 4976, 5589, 6028, 6238, 6643, 6872, 6926, 6994, 7003, 7722, 7748, 7839

L

Laboratory for Insulation Research, Mass. Inst. of Tech.
See Massachusetts Inst. of Tech., Cambridge. Lab. for Insulation Research.
Laboratory for Magnetics Research, Carnegie Inst. of Tech.
See Carnegie Inst. of Tech., Pittsburgh. Lab. for Magnetics Research.
Laboratory for Nuclear Science, Mass. Inst. of Tech.
See Massachusetts Inst. of Tech., Cambridge. Lab. for Nuclear Science.
Laboratory of Carl A. Zapffe and Associates.
See Zapffe (Carl A.) and Associates, Baltimore.
Laboratory of Molecular Structure and Spectra, Univ. of Chicago.
See Chicago. Univ. Lab. of Molecular Structure and Spectra.
Langley Aeronautical Lab., Langley Field, Va., 9: 4766, 5960
Lehigh Univ., Bethlehem, Penna., 9: 52, 6882
Lehigh Univ., Bethlehem, Penna. Inst. of Research., 9: 1502, 4188, 5634, 7822
Lewis Flight Propulsion Lab., Cleveland., 9: 142, 1105, 1248, 1249, 1250, 1251, 1805, 1813, 2229, 2693, 2694, 3125, 4131, 4132, 4140, 4142, 4342, 4433, 4767, 4769, 4794, 4979, 5355, 5633, 5636, 5716, 7348
Library of Congress. Technical Information Div., Washington, D.C., 9: 55, 2134, 4063, 6180, 6595

Linde Air Products Co. Tonawanda Lab., Tonawanda, N. Y., 9: 1041
Little (Arthur D.) Inc., Cambridge, Mass., 9: 1552, 7023
Livermore Research Lab., Calif. Research and Development Co.
See California Research and Development Co. Livermore Research Lab., Livermore, Calif.
LOBUND Inst., Univ. of Notre Dame.
See University of Notre Dame, South Bend, Ind. LOBUND Inst.
Los Alamos Scientific Lab., N. Mex., 9: 138, 143, 152, 155, 301, 302, 376, 513, 514, 619, 620, 648, 649, 692, 848, 876, 987, 1017, 1551, 1600, 1697, 1705, 1711, 1739, 1740, 1761, 1762, 1823, 1824, 1896, 1943, 2016, 2723, 2990, 3007, 3211, 3811, 3816, 3823, 3913, 3928, 3995, 4110, 4414, 4507, 4642, 4653, 4941, 5111, 5137, 5256, 5257, 5347, 5404, 5540, 5625, 5723, 5836, 5913, 5954, 6092, 6141, 6179, 6245, 6377, 6605, 6706, 6724, 6952, 7291, 7443, 7444, 7447, 7744
Louisville, Ky. Univ. Inst. of Industrial Research., 9: 3380
Lovelace Foundation for Medical Education and Research. Research Labs., Albuquerque, N. Mex., 9: 877, 3359, 3360
Lubrication Lab., Mass. Inst. of Tech.
See Massachusetts Inst. of Tech., Cambridge. Lubrication Lab.

M

Maine. Univ., Orono., 9: 6209
Mallory (P. R.) and Co., Inc., Indianapolis., 9: 1267, 2717
Martin (Glen L.) Co., Baltimore., 9: 6105
Maryland. Univ., College Park., 9: 5189, 7949
Massachusetts Inst. of Tech., Cambridge., 9: 175, 520, 521, 623, 653, 946, 972, 973, 1476, 1486, 1527, 1815, 1816, 2282, 2294, 2295, 2496, 2702, 2727, 2793, 2830, 3111, 3163, 3177, 3383, 3457, 4162, 4166, 4234, 4455, 4456, 4458, 4459, 4777, 4779, 4939, 5341, 5359, 5635, 5661, 5693, 5721, 7327, 7454, 7567, 7752
Massachusetts Inst. of Tech., Cambridge. Dept. of Metallurgy., 9: 4980, 5986
Massachusetts Inst. of Tech., Cambridge. Digital Computer Lab., 9: 1282
Massachusetts Inst. of Tech., Cambridge. Div. of Industrial Cooperation., 9: 7024
Massachusetts Inst. of Tech., Cambridge. High Voltage Research Lab., 9: 1368
Massachusetts Inst. of Tech., Cambridge. Lab. for Insulation Research., 9: 342, 3408
Massachusetts Inst. of Tech., Cambridge. Lab. for Nuclear Science., 9: 1066, 1071, 1139, 2331, 4205
Massachusetts Inst. of Tech., Cambridge. Lubrication Lab., 9: 961, 3487
Massachusetts Inst. of Tech., Cambridge. Nuclear Engineering Project., 9: 7919, 7920
Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics., 9: 652, 1304, 4210, 5097, 6370, 6546, 7025
Massachusetts Inst. of Tech., Cambridge. Servomechanisms Lab., 9: 3207, 3588, 3589, 4515, 7070
Massachusetts Inst. of Tech., Cambridge. Solid-State and Molecular Theory Group., 9: 231, 4479
Materials Lab., Allison Div., General Motors Corp.
See Allison Div. Materials Lab., General Motors Corp., Indianapolis.
Mathieson Chemical Corp., Baltimore., 9: 515, 518, 597, 598
Mellon Inst. of Industrial Research, Pittsburgh., 9: 6171
Metal Hydrides Inc. Chemical Research Lab., Beverly, Mass., 9: 600
Metal Trims, Inc., Youngstown, Ohio., 9: 2276, 6292
Metallurgical Advisory Committee on Titanium., 9: 2283, 2284, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2730, 4174, 4795, 4944
Metallurgical Labs., Dow Chemical Co.
See Dow Chemical Co. Metallurgical Labs., Midland, Mich.
Metallurgical Labs., Sylvania Electric Products Inc.
See Sylvania Electric Products Inc. Metallurgical Labs., Bayside, N. Y.
Metallurgy Development Advisory Committee, AEC., 9: 7003
Metals Research Lab., Case Inst. of Tech.
See Case Inst. of Tech., Cleveland. Metals Research Lab.
Michigan State Coll., East Lansing., 9: 9, 546, 547, 4741
Michigan. Univ., Ann Arbor., 9: 292, 293, 734, 850, 2948, 6290, 7104, 7441, 7727
Michigan. Univ., Ann Arbor. Engineering Research Inst., 9: 168, 639, 962, 1268, 1550, 2275, 2279, 3478, 3479, 3483, 3842, 4185, 4810, 5345, 5776, 5952, 6293, 6507, 7346, 7783, 7786
Michigan. Univ., Ann Arbor. Michigan Memorial-Phoenix Project., 9: 4870
Microwave Lab., Stanford Univ.
See Stanford Univ., Calif. Microwave Lab.
Mine Safety Appliances Co., Callery, Penna., 9: 605, 935, 948, 1254, 1806, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 3827, 4122, 4175, 4179, 4989, 5318, 5638, 5657, 6247, 6678, 6953, 6958, 6999, 7349
Minerals Research Lab., Inst. of Engineering Research, Univ. of Calif., Berkeley.
See California. Univ., Berkeley. Minerals Research Lab.
Minnesota Mining and Manufacturing Co., St. Paul., 9: 1487, 3083, 4953, 6210
Minnesota. Univ., Minneapolis., 9: 254, 255, 1514, 1829 4984, 5061, 5948, 5979, 6342, 6343, 6584, 7746
Minnesota. Univ., Minneapolis. Inst. of Tech., 9: 6243
Minnesota. Univ., Minneapolis. Rosemount Aeronautical Labs., 9: 3578
Monomer-Polymer, Inc., Chicago., 9: 4707
Monsanto Chemical Co., Dayton, Ohio., 9: 4120
Montreal. Univ., 9: 4830
Mound Lab., Miamisburg, Ohio., 9: 54, 76, 1235, 1236, 1475, 1479, 1490, 2054, 2181, 2332, 2399, 2671, 2844, 2952, 3757, 3793, 3929, 4060, 4365, 4638, 7056, 7453

N

National Advisory Committee for Aeronautics. Subcommittee on Heat-Resisting Materials., 9: 4170
National Bureau of Standards, Washington, D. C., 9: 77, 354, 698, 853, 1252, 1418, 2076, 3054, 3082, 3117, 3861, 4738, 5279, 5356, 5637, 5679, 5700, 5711, 5717, 6291, 6628, 6708, 6941, 6995, 7052, 7057, 7314, 7706, 7840
National Bureau of Standards. Office of Basic Instrumentation, Washington, D. C., 9: 273, 5703, 6241, 6242, 6677, 6707, 6709
National Canners Assn. Washington Research Labs., Washington, D. C., 9: 11
National Inst. of Arthritis and Metabolic Diseases, Bethesda, Md., 9: 1720

National Lead Co., Inc. Raw Materials Development Lab., Winchester, Mass., 9: 2635, 3779, 5250, 7275, 7728
National Lead Co. of Ohio, Cincinnati., 9: 1283
National Research Corp., Cambridge, Mass., 9: 4809, 7343, 7752
National Research Council. Div. of Medical Sciences., 9: 3722, 3723, 3724, 3725
National Research Council. Materials Advisory Board., 9: 7347
National Research Council of Canada. Atomic Energy Project, Chalk River, Ont., 9: 346, 612, 879, 2252, 2405, 2473, 3248, 3667, 3714, 4037, 4171, 4236
Natural Resources Research Inst., Univ. of Wyo.
See Wyoming. Univ., Laramie. National Resources Research Inst.
Naval Air Experimental Station. Aeronautical Materials Lab., Philadelphia., 9: 171, 3500
Naval Air Experimental Station. Aeronautical Structures Lab., Philadelphia., 9: 7430
Naval Engineering Experiment Station, Annapolis., 9: 941, 1264, 2280, 3145, 3168, 3169, 3459, 3507, 3824, 3859, 3860, 4782, 5947, 6947, 6948
Naval Material Lab., Brooklyn.. 9: 2850
Naval Medical Research Inst., Bethesda, Md., 9: 15, 274, 477, 1720, 1779, 3008, 3363, 5680, 6566, 6825
Naval Ordnance Lab., Corona, Calif., 9: 6235
Naval Ordnance Lab., White Oak, Md., 9: 303, 1318, 3126, 4858
Naval Ordnance Test Station, Inyokern (China Lake), Calif., 9: 3510, 3511, 4453
Naval Postgraduate School, Monterey, Calif., 9: 4869, 5080, 5510
Naval Radiological Defense Lab., San Francisco., 9: 234, 483, 658, 1176, 1447, 1991, 2111, 2591, 3365, 3370, 3721, 3937, 3938, 4051, 4668, 4913, 5213, 5246, 5261, 5425, 5573, 6095, 6156, 6406, 6567, 6592, 6825, 7186, 7233, 7234, 7408, 7409, 7456, 7611
Naval Research Lab. Optics Div., Washington, D. C., 9: 6348
Naval Research Labs., Univ. of Wis.
See Wisconsin. Univ., Madison. Naval Research Lab.
Naval Research Lab., Washington, D. C., 9: 99, 635, 1020, 1039, 1466, 1504, 1553, 1554, 1601, 1602, 1945, 2098, 2246, 2247, 2248, 3215, 3894, 3895, 4367, 4382, 4457, 4491, 4702, 4746, 5078, 5724, 5963, 6150, 6405, 6444, 6596, 6783, 6875, 7027, 7184, 7672
Naval School of Aviation Medicine, Pensacola, Fla., 9: 3362, 3726
Naval Underwater Ordnance Station, Newport, R. I., 9: 3512
NEPA Div., Fairchild Engine and Airplane Corp.
See Fairchild Engine and Airplane Corp., NEPA Div., Oak Ridge.
Nevis Cyclotron Labs., Columbia Univ.
See Columbia Univ., Irvington-on-Hudson, N. Y. Nevis Cyclotron Labs.
New Brunswick Lab., AEC, N. J., 9: 3070, 4381, 6620
New Hampshire. Univ., Durham., 9: 2679
New Mexico. Univ., Albuquerque., 9: 4414, 5913, 6179
New York Operations Office, AEC., 9: 2855
New York Operations Office. Health and Safety Lab., AEC., 9: 534, 7636
New York State Univ. Coll. of Ceramics, Alfred., 9: 6956
New York. Univ., New York., 9: 58, 4186, 7494
New York Univ., New York. Coll. of Engineering., 9: 2849, 4187, 4454, 4463, 4639, 5667, 6341
New York Univ., New York. Inst. of Mathematical Sciences., 9: 2381, 4238
New York Univ., New York. Post-Graduate Medical School., 9: 6585
New York Univ., New York. University Hospital., 9: 6585
Newport News Shipbuilding and Dry Dock Co., Va., 9: 966
Norman Bridge Lab. of Physics., Calif. Inst. of Tech.
See California Inst. of Tech., Pasadena. Norman Bridge Lab. of Physics.
North American Aviation, Inc., Downey, Calif., 9: 2, 139, 852, 1478, 2163, 2330, 3097, 3861, 3862, 3914, 4285, 4452, 4701, 4723, 4724, 4725, 4896, 5656, 5959, 6478, 6638, 6922, 6925, 7389, 7390, 7855, 7951
North Carolina. Dept. of Conservation and Development., 9: 5323
North Carolina State Coll., Raleigh., 9: 3978, 4088, 4173, 4747, 4748, 4771, 4988, 6062, 6248, 6543
North Carolina State Coll., Raleigh. School of Engineering., 9: 5149
North Carolina. Univ., Chapel Hill. Inst. of Statistics., 9: 3585, 3586
Northwest Electrodevelopment Lab., Albany, Oreg., 9: 7344
Northwestern Univ., Evanston, Ill., 9: 2130, 2161, 4379
Nuclear Cross Sections Advisory Group, AEC., 9: 7096
Nuclear Development Associates, Inc., White Plains, N. Y., 9: 1106, 1107, 2031, 2447, 2472, 2518, 3977, 5173, 6029, 6030
Nuclear Metals, Inc., Cambridge, Mass., 9: 7331
Nuclear Physics Labs., Columbia Univ.
See Columbia Univ., New York. Nuclear Physics Labs.

O

Oak Ridge Inst. of Nuclear Studies, Inc., Tenn., 9: 6849
Oak Ridge National Lab., Tenn., 9: 129, 288, 371, 655, 750, 901, 936, 1067, 1492, 1580, 1641, 1825, 1893, 2385, 2633, 2794, 2831, 2845, 2907, 2984, 2991, 3251, 3330, 3384, 4240, 4483, 4504, 4508, 4703, 4842, 5258, 5259, 5260, 5285, 5382, 5590, 5790, 5882, 5955, 6065, 6280, 6281, 6354, 6372, 6390, 6397, 6541, 6725, 7058, 7150, 7151, 7152, 7427, 7738
Oak Ridge National Lab., Y-12 Area, Tenn., 9: 1312, 1591, 1592, 1593, 1955, 1956, 1957, 2404, 2406, 2837, 2839
Oak Ridge Operations Office. Isotopes Div., AEC., 9: 2589
Oak Ridge School of Reactor Technology, Tenn., 9: 5833, 6066
Office of Basic Instrumentation, National Bureau of Standards.
See National Bureau of Standards. Office of Basic Instrumentation.
Office of Naval Research, Washington, D. C., 9: 6353
Ohio State Univ., Columbus. Cryogenic Lab., 9: 3081, 6205, 6369
Ohio State Univ. Research Foundation, Columbus., 9: 2026, 3146, 3409, 3696, 3994, 4706
Ohmart Corp., Cincinnati., 9: 348, 3548, 3549 3550, 4226
Oklahoma. Univ., Norman., 9: 51, 3756, 4378
Olin Mathieson Chemical Corp., Baltimore., 9: 1741, 1742, 1763, 2614, 2615, 3891, 4380, 4412, 4697, 4698, 4699, 4700, 7259, 7260, 7261, 7262, 7263, 7264, 7265
Ontario Research Foundation, Canada.
See Canada. Ontario Research Foundation
Ordnance School, Aberdeen Proving Ground, Md., 9: 6598
Oregon State Coll., Corvallis., 9: 1784

P

Palmer Physical Lab., Princeton Univ.
See Princeton Univ., N. J. Palmer Physical Lab.

Paris. Université., 9: 7036, 7055, 7442
Peninsular Chemresearch, Inc., Gainesville, Fla., 9: 5926
Pennsylvania Coll. for Women, Pittsburgh., 9: 2131, 4059
Pennsylvania State Coll., State College. School of Mineral Industries., 9: 3844
Pennsylvania State Coll., State College. Mineral Industries Experiment Station., 9: 341, 621, 622
Pennsylvania State Univ., State College. Cryogenic Lab., 9: 4366
Pennsylvania State Univ., University Park. Ionosphere Research Lab., 9: 2612
Pennsylvania State Univ., University Park. Petroleum Refining Lab., 9: 136, 2795, 3123
Pennsylvania State Univ., University Park., 9: 1738, 2413, 2695, 4940, 4972, 5932, 6866, 6870
Pennsylvania State Univ., University Park. Coll. of Chemistry and Physics., 9: 6218
Pennsylvania State Univ., University Park. Coll. of Mineral Industries., 9: 1511, 1744, 1826, 1827, 3461, 3462
Pennsylvania State Univ., University Park. Mineral Industries Experiment Station., 9: 5904, 5905
Pennsylvania State Univ., College Park. Petroleum Refining Lab., 9: 4484, 5934, 6949
Pennsylvania. Univ., Philadelphia., 9: 1763, 4318
Pennsylvania. Univ., Philadelphia., 9: 4697, 4698, 5276, 5623
Pennsylvania. Univ., Philadelphia. School of Medicine., 9: 2107, 2108
Pennsylvania. Univ., Philadelphia. School of Metallurgical Engineering., 9: 6285
Pennsylvania. Univ., Philadelphia. Towne Scientific School., 9: 176
Pepperdine Coll., Los Angeles., 9: 4062
Petroleum Refining Lab., Pennsylvania State Univ., Coll. of Chemistry and Physics.
See Pennsylvania State Univ., University Park. Petroleum Refining Lab.
Philadelphia Naval Shipyard. Industrial Test Lab., 9: 350
Philco Corp., Philadelphia., 9: 6689
Phillips Petroleum Co. Atomic Energy Div., Idaho Falls, Idaho., 9: 271, 533, 2050, 2446, 5148, 5420, 5422, 5423, 5424, 5531, 6027, 6039, 6194, 6604, 6896, 6897, 7833
Picatinny Arsenal, Dover, N. J., 9: 3216, 3452, 3513
Picatinny Arsenal. Samuel Feltman Ammunition Labs., Dover, N. J., 9: 3178, 4778
Pitman-Dunn Lab., Frankford Arsenal.
See Frankford Arsenal. Pitman-Dunn Lab., Philadelphia.
Pittsburgh-Des Moines Steel Co., Pittsburgh., 9: 659
Pittsburgh. Univ., 9: 637, 2106, 2735, 4482, 6869, 7351
Pittsburgh. Univ. Graduate School of Public Health., 9: 53
Pittsburgh. Univ. Sarah Mellon Scaife Radiation Lab., 9: 7560
Plastics Lab., Princeton Univ.
See Princeton Univ., N. J. Plastics Lab.
Polaroid Corp., Cambridge, Mass., 9: 1965, 3922, 4243, 5380
Polytechnic Inst. of Brooklyn.
See Brooklyn. Polytechnic Inst.
Poulter Labs., Stanford Research Inst.
See Stanford Research Inst. Poulter Labs., Calif.
Powder Metallurgy Lab., Rensselaer Polytechnic Inst.
See Rensselaer Polytechnic Inst., Troy, N. Y. Powder Metallurgy Lab.
Powder Metallurgy Lab., Stevens Inst. of Tech.
See Stevens Inst. of Tech., Hoboken, N. J. Powder Metallurgy Lab.
Pratt and Whitney Aircraft Div., United Aircraft Corp., Hartford, Conn., 9: 2447, 4124
Princeton Univ., N. J., 9: 1689
Princeton Univ., N. J. Aeronautical Engineering Lab., 9: 3809
Princeton Univ., N. J. Forrestal Research Center., 9: 638, 3275, 5248, 7393
Princeton Univ., N. J. Palmer Physical Lab., 9: 303, 721, 2924, 4858, 6001
Princeton Univ., N. J. Plastics Lab., 9: 2650
Purdue Research Foundation, Lafayette, Ind., 9: 3810, 5898, 7893, 7944
Purdue Univ., Lafayette, Ind., 9: 512, 949, 3420, 3622, 4952, 4990, 6188
Purdue Univ., Lafayette, Ind. Rocket Lab., 9: 3810
Purdue Univ., Lafayette, Ind. School of Aeronautics., 9: 6703
Purdue Univ., Lafayette, Ind. School of Chemical and Metallurgical Engineering., 9: 3420

Q

Quartermaster Food and Container Inst., Chicago., 9: 2549

R

Radiation Lab., Univ. of California, Berkeley.
See California. Univ., Berkeley. Radiation Lab.
Radiation Lab., Univ. of Calif., Livermore.
See California. Univ., Livermore. Radiation Lab.
Radiation Research Corp., West Palm Beach, Fla., 9: 2825
Radiobiological Lab., Univ. of Texas.
See Texas. Univ., Austin. Radiobiological Lab.
Radiological Lab., Univ. of Calif., San Francisco. School of Medicine.
See California. Univ., San Francisco. School of Medicine. Radiological Lab.
Radiological Research Lab., Columbia Univ.
See Columbia Univ., New York. Radiological Lab.
Radiophysics Lab., University Grounds, Sydney, Australia.
See Australia. Radiophysics Lab., Chippendale, New South Wales.
RAND Corp., Santa Monica, Calif., 9: 1, 1863, 2590, 2989, 2990, 3211, 3442, 3812, 3935, 3995, 4642, 5404, 5540, 5588, 5697, 6398, 7387, 7388
Raw Materials Development Lab., American Cyanamid Co. Atomic Energy Div.
See American Cyanamid Co. Atomic Energy Div. Raw Materials Development Lab., Winchester, Mass.
Reading, England. Univ., 9: 2739
Redstone Arsenal, Huntsville, Ala., 9: 3362
Rem-Cru Titanium, Inc., Midland, Penna., 9: 184, 2296, 4787
Rensselaer Polytechnic Inst., Troy, N. Y., 9: 516, 598, 1531, 3871, 4801, 5653, 7261
Rensselaer Polytechnic Inst., Troy, N. Y. Powder Metallurgy Lab., 9: 2716, 4163, 4164, 4165
Rensselaer Polytechnic Inst., Troy, N. Y. Walker Lab., 9: 4699
Research and Development Branch, Industrial Group, Capenhurst Works, United Kingdom Atomic Energy Authority, Capenhurst, Ches., England.
See Gt. Brit. Capenhurst Works, Ches., England.
Research and Development Branch, Industrial Group Headquarters, United Kingdom Atomic Energy Authority, Risley, Lancs, England.
See United Kingdom Atomic Energy Authority. Industrial Group H. Q., Risley, Lancs, England.

Research and Development Branch, Industrial Group, Windscale Works, United Kingdom Atomic Energy Authority, Windscale, Cumb, England.
See Gt. Brit. Windscale Works, Sellafield, Cumb., England.
Research Foundation, Ohio State Univ.
See Ohio State Univ. Research Foundation, Columbus.
Research Inst., Temple Univ.
See Temple Univ., Philadelphia. Research Inst.
Research Lab., Allegheny Ludlum Steel Corp.
See Allegheny Ludlum Steel Corp. Research Lab., Watervliet, N. Y.
Research Lab. of Electronics, Mass. Inst. of Tech.
See Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics.
Research Labs. Div., General Motors Corp.
See General Motors Corp. Research Labs., Div., Detroit.
Research Labs., Lovelace Foundation for Medical Education and Research, Albuquerque.
See Lovelace Foundation for Medical Education and Research. Research Labs., Albuquerque, N. Mex.
Rochester, N. Y. Univ., 9: 394, 1140, 1653, 1946
Rochester, N. Y. Univ. Atomic Energy Project., 9: 19, 62, 481, 847, 916, 1157, 1728, 2521, 3010, 4045, 4048, 4049, 4050, 4055, 4076, 4692, 5211, 5212, 5383, 5572, 5583, 5584, 5840, 5841, 5863, 5874, 5936
Rock Island Arsenal Lab., Ill., 9: 147, 3115
Rocket Lab., Purdue Univ.
See Purdue Univ., Lafayette, Ind. Rocket Lab.
Rosemount Aeronautical Labs., Univ. of Minn.
See Minnesota. Univ., Minneapolis. Rosemount Aeronautical Labs.
Royal Aircraft Establishment, Farnborough, Hants, England.
See Gt. Brit. Royal Aircraft Establishment, Farnborough, Hants, England.
Rutgers Univ., New Brunswick, N. J. School of Chemistry., 9: 7267
Ryan Aeronautical Co., Lindbergh Field, San Diego, Calif., 9: 1838, 1847, 3843

S

Saint Louis Univ., 9: 7262, 7263, 7264
Samuel Feltman Ammunition Labs., Picatinny Arsenal.
See Picatinny Arsenal. Samuel Feltman Ammunition Labs., Dover, N. J.
Sandia Corp., Albuquerque, N. Mex., 9: 5075, 7491
School of Aviation Medicine, Randolph AFB, Texas., 9: 4, 13, 14, 16, 478, 479, 877, 2109, 2110, 3727, 3728, 3729, 6562, 6826
Servomechanisms Lab., Mass. Inst. of Tech.
See Massachusetts Inst. of Tech., Cambridge. Servomechanisms Lab.
Shell Development Co., Emeryville, Calif., 9: 2790, 2791, 4422, 6679
Smith (A. O.) Corp., Milwaukee., 9: 964, 965, 1529, 3856
Solid-State and Molecular Theory Group, Mass. Inst. of Tech.
See Massachusetts Inst. of Tech., Cambridge. Solid-State and Molecular Theory Group.
Southern Research Inst., Birmingham, Ala., 9: 2354, 2355, 2356, 2357, 3775, 4215
Southwest Research Inst., San Antonio., 9: 517, 4108, 4420, 5626
Standard Oil Co. of Indiana, Chicago., 9: 1814
Standard Oil Co. of Indiana, Whiting., 9: 5310, 7320
Stanford Research Inst., Calif., 9: 518, 854, 2792, 3382, 3758, 5247, 5381, 5622
Stanford Research Inst. Poulter Labs., Calif., 9: 1237
Stanford Univ., Calif., 9: 2992, 3051, 4412, 4983, 5150
Stanford Univ., Calif. Applied Mathematics and Statistics Lab., 9: 3209
Stanford Univ., Calif. High-Energy Physics Lab., 9: 3644, 5109, 5165
Stanford Univ., Calif. Microwave Lab., 9: 772, 3661
Stanford Univ., Calif. School of Mineral Sciences., 9: 179, 2718
Statistical Research Lab., Univ. of Ill.
See Illinois. Univ., Urbana. Statistical Research Lab.
Sterling Chemistry Lab., Yale Univ.
See Yale Univ., New Haven. Sterling Chemistry Lab.
Stevens Inst. of Tech., Hoboken, N. J., 9: 6666
Stevens Inst. of Tech., Hoboken, N. J. Powder Metallurgy Lab., 9: 3173
Subcommittee on Heat Resisting Materials, NACA.
See National Advisory Committee for Aeronautics Subcommittee on Heat-Resisting Materials.
Sylvania Electric Products Inc., Bayside, N. Y., 9: 7003
Sylvania Electric Products Inc. Atomic Energy Div., Bayside, N. Y., 9: 7220
Sylvania Electric Products Inc. Chemistry Lab., Bayside, N. Y., 9: 6955
Sylvania Electric Products Inc. Metallurgical Labs., Bayside, N. Y., 9: 3872, 3873
Sylvania Electric Products Inc. Physics Labs., Bayside, N. Y., 9: 6955
Syracuse Univ., N. Y., 9: 597, 2297, 4127, 4700, 5909, 7265, 7290, 7746
Syracuse Univ., N. Y. Inst. of Industrial Research., 9: 1565, 4489, 5398, 7715

T

Technical Cooperation Program, AEC., 9: 2415, 3098, 4659, 4976
Technical Information Bureau, Ministry of Supply, England.
See Gt. Brit. Ministry of Supply. Technical Information Bureau.
Technical Information Div., Library of Congress.
See Library of Congress. Technical Information Div., Washington, D. C.
Technical Information Service, AEC., 9: 233, 288, 2077, 2100, 4658, 5360, 6146, 6185, 6186, 6288, 7002, 7028
Temple Univ., Philadelphia. Research Inst., 9: 57, 3394, 3498
Tennessee Eastman Corp., Oak Ridge., 9: 145, 656
Tennessee. Univ., Knoxville., 9: 185, 515, 1156, 1265, 1807, 4997, 5052
Tennessee Valley Authority, Wilson Dam, Ala., 9: 1183, 1445, 1746, 5640, 5641
Texas. Univ., Austin., 9: 4, 4969
Texas. Univ., Austin. Radiobiological Lab., 9: 478, 479, 2109, 6562
Thompson Products, Inc. Chemical and Metallurgical Lab., Cleveland., 9: 7358
Thomson Lab., General Electric Co.
See General Electric Co. Thomson Lab., Lynn, Mass.
Towne Scientific School, Univ. of Penna.
See Pennsylvania. Univ., Philadelphia. Towne Scientific School.
Tracerlab, Inc., Boston., 9: 266, 267, 268, 2847, 2848, 3250, 3930, 3931

U

United Kingdom Atomic Energy Authority. Industrial Group H. Q., Risley, Lancs, England., 9: 2822, 5193, 5194, 6808
United States Testing Co., Inc. Boston Research Div., Boston., 9: 6639, 6640
University of Notre Dame, South Bend, Ind., 9: 5287
University of Notre Dame, South Bend, Ind. LOBUND, Inst., 9: 2546
Utah. Univ., Salt Lake City., 9: 182, 2262, 3210
Utah. Univ., Salt Lake City. Inst. for the Study of Rate Processes., 9: 50, 849, 1181, 1905, 2207, 2251, 2384, 2731, 3143, 3144, 3214, 3381, 4264, 5057, 5944, 5987, 6226, 7026
Utah. Univ., Salt Lake City. Inst. of Rate Processes., 9: 5718
Utah. Univ., Salt Lake City. Radiobiology Lab., 9: 5209

V

Vacuum-Electronic Engineering Co., New Hyde Park, N. Y., 9: 2820
Victoreen Instrument Co., Cleveland., 9: 3546
Virginia-Carolina Chemical Corp., Richmond., 9: 1792
Virginia Polytechnic Inst., Blacksburg., 9: 596, 2208, 6871, 7671
Virginia. Univ., Charlottesville. Cobb Chemical Lab., 9: 4115, 4419
Vitro Corp. of America, New York., 9: 3122
Vita-Var Corp., 9: 947

W

Wall Colmonoy Corp. Research Lab., Detroit., 9: 5066
Washington Research Labs., National Canners Association, D. C.
See National Canners Assn. Washington Research Labs., Washington, D. C.
Washington Univ., St. Louis., 9: 2360
Watertown Arsenal Lab., Mass., 9: 1535, 2283, 2284, 2299, 4247, 5117, 5427
Watertown Arsenal. Materials Research Lab., Mass. 9: 5353, 5958
Wayne Univ., Detroit., 9: 519, 3814, 4770
Wayne Univ., Detroit. Computation Lab., 9: 4299
Weather Bureau, Washington, D. C., 9: 7492
West Virginia. Univ., Morgantown., 9: 4057, 4094
Western Gear Works, Lynwood, Calif., 9: 1817
Western Reserve Univ., Cleveland., 9: 726
Western Reserve Univ., Cleveland. Atomic Energy Medical Research Project., 9: 17, 18, 3047, 3376, 4358, 4666, 4667, 4691
Western Reserve Univ., Cleveland. Ultrasonics Research Lab., 9: 5053
Westinghouse Electric Corp. Atomic Energy Div., Pittsburgh., 9: 7147
Westinghouse Electric Corp. Atomic Power Div., Pittsburgh., 9: 429, 779, 1656, 2742
Westinghouse Electric Corp., Pittsburgh., 9: 974
Westinghouse Electric Corp. Research Labs., East Pittsburgh, Penna., 9: 1935
Wichita, Kan. Univ. Foundation for Industrial Research., 9: 7022
Wisconsin. Univ., Madison., 9: 1964, 2132, 2412, 4995, 5910, 6931, 6932, 6933, 6934
Wisconsin. Univ., Madison. Naval Research Lab., 9: 235
Works Control Lab., Babcock and Wilcox Co.
See Babcock and Wilcox Co. Works Control Lab., Barberton, Ohio.
Wright Air Development Center. Materials Lab., Wright-Patterson AFB, Ohio., 9: 4808, 4961, 4981, 5311, 5976, 6196, 6336, 7790
Wyoming. Univ., Laramie. National Resources Research Inst., 9: 945

Y

Yale Univ., New Haven., 9: 1414, 5540, 7268
Yale Univ., New Haven. Sterling Chemistry Lab., 9: 3434

Z

Zapffe (Carl A.) and Associates, Baltimore., 9: 963

SUBJECT INDEX FOR VOLUME 9

The user of this subject index should bear in mind that subjects, rather than words, have been indexed. The indexer tries to select what to him seems to be the most probable and logical place to look for the information under consideration. Since it is not possible to know exactly where users of the index might look for certain items of information, numerous cross references are included to guide the user to other sources of information on related subjects. Thus, the user must decide what the indexer would consider to be the most appropriate index entries for specific items of information. This problem, however, is inherent in the preparation and use of any subject index and is not, in any sense, peculiar to the index of *Nuclear Science Abstracts*.

Generally, the direct form of subject entry is used in this index rather than inverted headings or, in some cases, subheadings; e.g., Amino acids rather than Acids, amino; Helium isotopes He^4 rather than Helium—isotopes He^4 or Helium—He^4 isotopes. Note, however, that in some cases modifying terms are used parenthetically in preference to using a more direct type of entry which would result in the scattering of information; e.g., Sodium (liquid) rather than Liquid sodium. Organic compounds, on the contrary, are usually entered in the index in the inverted form so that substituted compounds are listed near the parent compound, e.g., Benzene, bromo- rather than Bromobenzene. In general, the style of nomenclature used is that of Chemical Abstracts except that some items listed there as subheadings are elevated to form part of the main heading, e.g., Butyric acid, ethyl esters rather than Butyric acid—ethyl esters. Salts of organic acids are indexed in a similar fashion.

Inorganic compounds are indexed in the direct form, listing cations in the order of increasing valence in the case of polycationic salts of varying valence and in alphabetic order for polycationic salts in which all cations have the same valence; e.g., Sodium aluminum sulfates and Potassium sodium sulfates.

In general, any one specific item of information is entered in the index in every place where the user might probably look for it; e.g., an item on sodium–potassium alloys is entered under both Sodium–potassium alloys and Potassium–sodium alloys. A study of the effects of x radiation on hair will be found under both X radiation and Hair. Note, however, that if a dog has been used arbitrarily as the experimental animal, the information will not be found under Dogs as it is assumed that the same results would have been obtained in tests on other animals. Note also that papers are not usually entered under broad general headings; e.g., a paper on treatment of thyroid disease with I^{131} will be listed under Thyroid diseases and under Iodine isotopes I^{131}, but not under Radiotherapy.

Main headings are listed in alphabetic order. A parenthetic qualifier following a main heading is disregarded in alphabetizing unless there is more than one so that the modifier determines the order; e.g., Sodium, Sodium (gaseous), Sodium (liquid), Sodium acetates.

Descriptive phrases (modifiers) rather than ordinary subheadings are used under the main headings to give a better indication of the material covered in an abstract than would be possible with only a word or two. Such phrases are written so that the idea considered most important is presented first, if this does not result in too awkward an expression. However, in searching the index it is advisable to scan all the modifiers under a main heading in order to determine which abstracts should be consulted for the desired information. Many of the modifiers are designed to be read in inverted order or to be read with the main heading inserted at the position of the comma in order to obtain a meaningful phrase; e.g., Uranium—allotropic transformation temperatures of, effect of cooling rate on is read "effect of cooling rate on allotropic transformation temperatures of uranium." Experience in using an index of this type will be the best guide in obtaining the desired information, and a consideration of synonymous, or nearly synonymous, terms will prove valuable.

The number followed by a colon is the volume number, and the numbers following are the abstract numbers. The designation (R) following an abstract number indicates that it is an abstract of a progress report; the designation (J) indicates that it is an abstract of a journal (published literature) article; and the designation (P) indicates that it is an abstract of a patent. Abstract numbers for reports other than progress reports carry no letter designations.

SUBJECT INDEX FOR VOLUME 9

A

Abdomen

x-ray transmission through, in living subjects, comparative studies, 9: 3039(J)

Absorption

(See also appropriate subheadings under materials absorbed; see also Adsorption.)

effects of hydrochemical conditions, 9: 1791

of uranyl ions by clays, 9: 6559(J)

Absorption spectra

(See also appropriate subheadings under specific materials; see also main headings identified by name of radiation, e.g. Neutron spectra.)

of bismuth-activated phosphors, CaO(Bi) and SrO(Bi), 9: 6545(J)

of polycyclic hydrocarbon crystals, 9: 7300(J)

Accelerator targets

(See Radiation targets.)

Accelerator tubes

electrical properties of helical, for linear accelerators, 9: 1372(J)

shunt impedance of helical, for proton linear accelerator, 9: 1373(J)

Accelerators

(See also Betatrons; Bevatron; Brookhaven Synchrotron; Calutrons; Cockcroft-Walton accelerators; Cyclotrons; Linear accelerators; Synchrocyclotrons; Synchrotrons; Van de Graaff accelerators.)

alternating gradient channel in, using permanent bar magnets, 9: 395

design and operating characteristics of 1 Mev, at Centre de Physique Nucléaire de Liège, 9: 6779(J)

deuteron, for neutron production, design, 9: 5172(J)

development of, and applications in high energy nuclear physics, 9: 5784(J)

electron, and high-resolution analyzer for absorption studies, 9: 3665(J)

focusing in high energy, 9: 7103(J)

four plate omegatron, design and determination of ion mass ratios, 9: 5166

high-energy, book on, 9: 3992(J)

high-energy, liquid H, D, and He targets for use with, 9: 2469(J)

nuclear reactions in, in region 380 to 660 Mev, 9: 7908(J)

operation and development of the bevatron, 9: 5509

oscillators for, the frequency generated by a spin-controlled, 9: 7163

preparation of alkali and alkaline earth metals as targets for, 9: 6088(J)

proton, development and design, 9: 6781(J)

proton, geometrical considerations of helical wave guide for, 9: 6498(J)

single cavity, design, 9: 5171(J)

space charge effects, review, 9: 6780(J)

studies with, review of, 9: 6753(J)

Accelerometers

barium-titanate, design, 9: 6241, 6242

calibration of steady-state, to 4000 g, design and testing, 9: 6709

design, 9: 8002(P)

design and performance of, for determination of sinusoidal acceleration at peak levels near that of gravity by chatter method, 9: 273

Acetaldehyde, dichloro-

polarographic determination, 9: 539(J)

Acetals

reaction of 2,2,3,3,4,4-hexafluoro-1,2-propanediol with butyl formal, 9: 1767(R)

Acetates

(See also specific acetates.)

degradation of C^{14}-labeled, using a combined combustion-diffusion vessel, 9: 2178(J)

Acetic acid

adsorption of, by polyvalent forms of anion-exchange resins, 9: 2212(J)

aqueous solution, effects of heavy-particle radiation on, 9: 2197

exchange of D and, effects of nitro compounds on, 9: 2182(J)

glacial, reductometric titrations in, 9: 536(J)

glacial, titrations in, based on formation of insoluble salts, 9: 535(J)

radiation chemistry, 9: 2551(R)

vapor phase association of D-labeled, 9: 3409(J)

Acetic acid, amino-

(See Glycine.)

Acetic acid, chlorocresoxy-

separation of Th from cerite earths by, 9: 594(J)

Acetic acid 2,4-dichlorophenoxy-

use in separation of Th from Zr, Ti, and Fe, 9: 2641(J)

Acetic acid, (ethylenediamine)tetra-

analytical uses of, in complexation of Th, 9: 6905(J)

determination of uranyl ion by chelation with, 9: 3436(J)

effects of, on chromosome rearrangement in Drosophila, 9: 2099(R)

high-frequency titrations of divalent metals using, 9: 2169(J)

Acetic acid, (ethylenediamine)tetra-, calcium salts

effects of, on excretion of Pu in rats, 9: 6172(J)

Acetic acid, (ethylenediamine)tetra- complexes

rare earth, physical properties of, 9: 6617(J)

Acetic acid, (ethylenediamine)tetra-, rare earth salts

solubilities, 9: 3428(J)

Acetic acid (ethylenediamine)tetra-, sodium salts

as analytical reagent for Co and Cr, 9: 4086(J)

Acetic acid, mercapto- complexes

autoreduction, spectrophotometric studies, 9: 4205(R)

Acetic acid, (n-hydroxyethylethylenediamine)tri- complexes
with rare earths, stability, 9: 5618

Acetic acid, trichloro-
chemical reactions with C_6H_5Li in ether, 9: 5927(J)
decarboxylation, reaction mechanisms, 9: 5883(J)

Acetic acid, trifluoro-
chemical reactions with C_6H_5Li in ether, 9: 5927(J)
compounds of sodium trifluoroacetate with D-labeled, infrared spectra, 9: 3084(J)
compounds with sodium trifluoroacetate, hydrogen bonding, infrared spectra, and heat of dissociation, 9: 3084(J)

Acetic acid, trifluoro-, sodium salts
compounds with D-labeled trifluoroacetic acid, infrared spectra, 9: 3084(J)
compounds with trifluoroacetic acid, hydrogen bonding, infrared spectra, and heat of dissociation, 9: 3084(J)
infrared spectra, 9: 3084(J)

Acetic acid, trifluorothiol-, ethyl esters
acetylating property of, for amino acids and peptides in aqueous solution, 9: 123

Acetic acid, triphenylethyl esters
mechanism of Wagner-Meerwein rearrangement in, 9: 1755(J)
triple-labeling experiments on isotope position isomerization of, 9: 1756(J)

Acetic acid–water systems
activity coefficients, 9: 4713(J)

Acetone
fundamental vibrations of, 9: 917(J)

Acetone, acetyl-
(See 2,4-Pentanedione.)

Acetone, hexafluoro-
synthesis and vapor pressure, 9: 3085(J)

Acetone, thenoyltrifluoro- –butyl phosphate–kerosene systems
solvent extraction of Pr and Nd in, 9: 906

Acetone, thenoyltrifluoro- chelates
formation of, with 3 ions of elements 95 through 100, 9: 924(J)

Acetylene
infrared spectrum and molecular constants of C_2D_2, 9: 1766(J)
radiation chemistry, 9: 2662(J)
radiolysis of, induced by β particles, 9: 4959

Acetylene, chloro-
quadrupole coupling of deuterons in D-labeled, 9: 2647(J)

Acetylene, diphenyl- crystals
preparation, 9: 4948

Acid fluoride ions
divalent hydrogen in, 9: 2185(J)

Acid leach solutions
(See Uranium leach solutions (acid).)

Acids
(Limited to general or over-all reports on acids; see also specific acids.)
adsorption of, by polyvalent forms of anion-exchange resins, 9: 2212(J)
definitions of concepts of, 9: 3056(J)
determination of free, in Pu solutions, 9: 4110
theory, 9: 3762

Acrylamide
radioinduced polymerization, 9: 4958(R)

Acrylonitriles
polymerization, effects of γ radiation on, 9: 2847(R)

Actinide oxides
heat and free energy of formation, 9: 529(J)

Actinides
(Type 5f rare earths; see also specific elements; see also Rare earths; Transplutonic elements; Transuranic elements.)
absorption spectra and electron energy levels, 9: 4392(J)
absorption spectra of ions of, with two 5f-electrons, 9: 3001(J)

Actinium
bibliography, 9: 3551
boiling point and vapor pressure at 1,600°C, 9: 54
chelation with thenoyltrifluoroacetone, 9: 924(J)
ion exchange of, from Th at high temperatures, 9: 593(J)
ionizing particles from active deposits of, recorded by photographic emulsions, 9: 6524(J)
melting point, 9: 1757(J)
preparation of, by reduction of actinium fluoride with Li vapor, 9: 1757(J)
separation from Fr^{223} by paper chromatography, 9: 1225(J)
x-ray and γ emission, 9: 4899(J)

Actinium fluorides
reduction of, with Li vapor to prepare Ac, 9: 1757(J)

Actinium isotopes Ac^{226}
decay schemes and nuclear spectra, 9: 4883

Actinium isotopes Ac^{227}
decay scheme, 9: 2952
half life, 9: 2960(J)
nuclear magnetic and electric quadrupole moments, 9: 5490(J)
separation from rat urine, 9: 2671

Actinium isotopes Ac^{228}
period of 57-kev level, 9: 442(J)

Activation analysis
(See also Radiometric analysis.)
a comparison of, with other analytical methods, 9: 2170(J)
neutron, limitations of, general discussion of, 9: 6200(J)
of trace impurities in Si using scintillation spectrometry, 9: 4725(J)

Addition compounds
structures and reactions, 9: 7714(J)

Activated carbon
(See Carbon (activated).)

Adenine
incorporation of, into nucleic acids, effects of tumor growth, x radiation, and 8-azaguanine on, in mice, 9: 1449(J)
incorporation of, into nucleic acids, tracer study, 9: 3377
metabolism in mice, tracer study, 9: 2608, 4705(R)
metabolism of, effects of irradiation on, 9: 7272(R)
metabolism of labeled, by rats, 9: 61(R)

Adenosine, methylthio-
biosynthesis, 9: 2547(R)

Adenosinephosphoric acids
effects of injected, on radiosensitivity of rabbits, 9: 5239(J)
effects of, on spectral properties of muscle proteins, 9: 5924(J)
hydrolysis of, mechanism, 9: 473(J)

Adenylic acid

(See Adenosinephosphoric acids.)

Adhesion

of air bubbles to hydrophobic surfaces in water, theoretical analysis of, 9: 148(J)

Adhesives

performance of Epon VI, for glass-to-metal joints, 9: 1368

for plastic-to-plastic and plastic-to-Al joints, effects of temperature on bond strengths, 9: 651

properties, 9: 4114(R)

sonic inspection of bonding of sheet metal with, 9: 1263(R)

Adrenal glands

cortical activity of, effects of x radiation on, in rats, 9: 3365

effects of x radiation on growth and histochemistry of transplants of, in rats, 9: 22(J)

influence of, on mast cell number in skin of rats, 9: 3(R)

isolated calf, effects of irradiation on cortical function and morphology, 9: 1166(J)

isolated calf, effects of irradiation on steroidogenesis in, 9: 1165(J)

removal, effects on response of skin to thermal radiation in rats, 9: 4664

Adrenal hormones

effects of, on capillary permeability in perfused rat tissues, 9: 4661(J)

Adrenaline

effects of, on liver blood flow, tracer study, 9: 2609

Adsorbents

activated diffusion in, 9: 4755(J)

(See also Bauxite; Carbon, Charcoal; Clays; Filter materials; Silicon oxides.)

surface area of, from the adsorption isotherms, calculation of, 9: 6371(J)

Adsorption

(See also as subheading under materials adsorbed; see also Absorption.)

carbon dioxide, on porous glass barriers, 9: 7022

determination of pore size distribution and surface area from isotherms, 9: 2216(J)

electronic levels of atoms adsorbed on surface of a crystal, 9: 1930(J)

five site model of, theory and applications, 9: 4366

of gases, interaction of a molecule with the surface of a solid, quantum theory, 9: 3433(J)

and ion exchange in metal-metal ion systems, review, 9: 121(J)

physical, reversibility in, 9: 3113(J)

properties of, effect of basic structural types of adsorbents on, 9: 915(J)

review, 9: 3063(J), 3114(J)

Adsorption separation processes

(See also Ion exchange processes.)

aluminum oxide used for, determinations of adsorptive capacity of, 9: 6229(J)

Aerodynamics

(See also Boundary layer; Fluid flow; Gas flow; Supersonic flow.)

investigation of compression shocks and boundary layers in gases moving at high speed, 9: 1014(J)

Aerojet General Corp., Azusa, Calif.

progress reports on inorganic and semi-organic polymers, 9: 6867(R)

Aerosol generators

design, 9: 2357(R), 5936

performance, 9: 3360

for preparation of water aerosols, design and performance, 9: 3359

for production of monodisperse liquid or solid aerosols, design, 9: 531

Aerosols

(See also Colloids; Dusts; Fog; Particles; Powders; Smokes.)

absorption in spray columns, 9: 7692

aggregation, properties affecting, 9: 3904(R), 4345

biological, effects of suspending fluids on particle size distribution, 9: 4041

coagulation and settling in turbulent gas flow, theory, 9: 2359(J)

collection of, by wetted fiberglas media, 9: 7744

collection of, performance of centrifugal scrubbers for, 9: 4125(J)

deposition of, by electrostatic forces from a moving stream, 9: 934

detection, design of a photometer for, 9: 4215

detection, performance of a photometer for, 9: 3775(R)

diffusion formulas and pollution problems, 9: 4216

droplet size, photometric measurement of, 9: 4939

filtering action of curved tubes in laminar flow of, 9: 4488

filtration of, performance of electrostatic mechanisms, 9: 4831

filtration of radioactive, using glass fibers, 9: 1401(J)

formation and particle size measurement methods, 9: 4830

growth of particles in a turbulent supersaturated fluid, 9: 1912

halide ion–water, sampling surface for, 9: 1001(J)

impaction, design of annular impactor, 9: 6686

impaction on cylinders, 9: 3558(J)

monitoring of toxic dusts and fumes, 9: 1913(J)

monodisperse solid, filtration, 9: 531

particle size measurement, 9: 253(J), 819

particle size measurement, calibration of equipment, 9: 7409

particle size measurement, design of a photometer for, 9: 4215

particle size measurement, equipment, 9: 2354(R), 2355(R), 2356(R), 2537(R), 3359

production from solutions of soluble compounds or suspensions of insoluble compounds, 9: 5936

radioactive, sampling and measurement of, 9: 7036, 7037(J)

removal, by electrostatic precipitation, theory, 9: 4426(J)

removal, from air by fibrous media, 9: 4425(J)

removal by electrostatic charging of fabrics, 9: 4428(J)

removal of high resistivity, modified electrostatic precipitator for, 9: 4427(J)

review, 9: 3063(J)

sampling, importance of sampling periods, 9: 4042

sampling equipment, design, 9: 3721

size reduction, review, 9: 3232(J)

water, particle size measurements of, utilizing a droplet-indicating photographic film, 9: 7408

Africa

mining and production of U in South Africa, 9: 4786(J)

Agriculture

crop yields, effect of radioactive substances on, 9: 7619(J)

Air

(See also Atmosphere; Breath; Gases; Meteorology; Stack disposal; Ventilation.)

aerosol diffusion formulas and pollution problems, 9: 4216

aerosol removal from, by electrostatic filtration, 9: 4426(J)

alpha particle ranges and straggling in, 9: 782(J)

analysis of, for O_2, survey of methods, 9: 77

angular neutron scattering cross sections of, 9: 1103

boundary lubrication of steel with, 9: 4979

bubbles, drag and shape in various liquids, 9: 6244

Air (cont'd)
compressible flow, selection of graphs for use in calculations of, 9: 3139(J)
contamination of, meteorological factors affecting, 9: 7492
decontamination by absorption of impurities in spray columns, 9: 7692
design and performance of wet dust scrubbers to prevent pollution of, 9: 3091(J)
diffusion of, meteorological factors affecting, 9: 7492
effect of vibrations on heat transfer in, 9: 5316(J)
energy loss of secondary electrons in, effects of various cavity wall materials on, 9: 2045(J)
energy required to produce one ion pair, 9: 5702(J)
equation of state of, on the Thomas-Fermi statistical model, 9: 3211
evaporation of spherical drops of liquid falling in, 9: 1015(J)
filtering of hot-lab, by fiber glass filters, 9: 549
filtering of hot-lab, by glass wool filters, 9: 560(J)
gamma scattering by, special distribution of, 9: 1104
gasometric analysis for boranes, 9: 6869
ion pair formation, 9: 4039(R)
monitoring for Be, radiometric equipment design, 9: 5720(R)
monitoring for β activity, design of air sampling chamber, 9: 5113
monitoring for Li, 9: 4941
monitoring for radon, performance of scintillation detector, 9: 4510
monitoring of, for Be dust, 9: 5076
monitoring of α particles in, instrument for, 9: 7856
pollution, bibliographies, 9: 7(J), 4429(J)
radioactivity after atomic explosions, in France, 9: 2536(J)
radioactivity in, following atomic explosions, 9: 6116(J)
radioactivity measurements, ionization chamber for, 9: 1326(J)
radioactive particles in, sampling and measurement of, 9: 7037(J)
reaction at high temperatures between liquid Na systems and, 9: 7033(J)
removal of microörganisms from, by fibrous media, 9: 4425(J)
sampling, design of annular impactor, 9: 6686
sampling, importance of sampling periods, 9: 4042
sampling techniques, 9: 2130
scattering of Co^{60} γ radiation by, 9: 6093
scattering of molecules of, from surfaces, 9: 650
single scattering in air, Monte Carlo evaluation, 9: 2926
single scattering of neutrons in, 9: 2028
solubility in water, instrument for measuring, 9: 3068
spectrophotometric analysis of, for boron hydrides, 9: 3069
stopping of deuterons and protons in, 9: 5803(J)
thermal conductivity and viscosity of, from 0 to 600°C, 9: 2822
thermodynamic properties of argon-free, to 15,000°K, 9: 7052
x-ray absorption, 9: 4524(J)
x-ray-induced luminescence from, 9: 5181(J)

Air flow
(See Gas flow.)

Aircraft
(See also Nuclear aircraft.)
applicability of Ti to, 9: 7356
development of high-speed, by ionic controlled air flow, 9: 7827(J)
use of Ti alloy sheet in airframe components, 9: 7354

Aircraft power plants
development of ceramic coatings for use in, 9: 6645

Aircraft reactors
shielding design, 9: 2027, 2030

Alanine
radioinduced decomposition, 9: 4402(J)

Alanine, leucyl-
preparation, 9: 2136(R)

Alaska
exploration, 9: 5326(R)
exploration and U distribution, 9: 628(J)
exploration for radioactive deposits in, 9: 6967(J)
occurrence of Th minerals in, 9: 1523(J)

Albumins
biosynthesis of C^{14}-labeled, 9: 2105(J)
metabolism in placenta, autoradiographic study with S^{35} tracer, 9: 5208(J)
self-diffusion coefficients of ovalbumin in aqueous ovalbumin solutions, tracer study, 9: 1229(J)
synthesis in x-irradiated wheat, tracer studies, 9: 5576(J)

Alcohols
(See also specific alcohols, e.g. Methanol.)
aliphatic, hydrogen exchange between triphenylcarbinol and, 9: 2331(J)
infrared spectra, 9: 7675
radiation decomposition of, 9: 102

Algae
culturing P^{32}-labeled, 9: 3358(J)
phosphate metabolism, tracer study, 9: 3(R)
photosynthesis, kinetics, 9: 7272(R)
synthesis and metabolism of pyruvic acids by, 9: 4929

Alginates
viscosity of, effects of radiation and of radiomimetics, 9: 2658(J)

Alice Claim (Calif.)
geology, 9: 3837(J)

Aliphatic compounds
(See Organic compounds.)

Alizarin
analytical uses of, in colorimetric determination of Zr, 9: 6201(J)

Alizarin Red S complexes
of hafnium and Zr, polarographic behavior and absorption spectra, 9: 6933
structure of, use in determination of Th, 9: 6902(J)
with thorium, chemical properties, 9: 875

Alkali metal–alkali metal halide systems
properties of, in thermal equilibrium, 9: 852

Alkali metal chlorides
diffusion coefficients of, in dilute aqueous solution, 9: 7268
thermodynamic properties of $MgCl_2$ in fused, 9: 3768(J)

Alkali metal compounds
preparation and properties of hydroxyfluoberyllates, 9: 5899(J)
preparation and properties of the fluoroplatinates, 9: 5903(J)

Alkali metal halide crystals
color centers in, chemical effects associated with, 9: 5895(J)
dosimetry of x and γ radiation by, 9: 6733(J)
electric conductivity, effect of annealing, 9: 5382(R)
expansion and coloration from x- or deuteron irradiation, 9: 5811(J)
fluorescence and thermoluminescence in x-irradiated, 9: 3682(J)
optical bleaching of F centers in x-rayed, 9: 6692(J)
photoconducting, capacitance and conductance effects in, 9: 2816(J)

Alkali metal halide crystals (cont'd)
pure and hydride containing, F centers in, 9: 2369(J)
Alkali metal halides
effects of fast-electron irradiation on, 9: 3329(J)
emission excitation, and absorption spectra of Ag-activated, 9: 3116(J)
luminescence, when activated by heavy metals, 9: 1784
microwave spectra of, molecular properties determined from, 9: 811(J)
molar heats of LiF, NaCl, KCl, KBr, KI, RbBr, and RbI between 10° and 273°K, 9: 7281(J)
photostimulated emission of activated, 9: 2424(J)
reaction with B_2O_3 to prepare B halides, 9: 598
Alkali metal oxides
colored, theoretical analysis, 9: 4067(J)
heat and free energy of formation, 9: 529(J)
Alkali metals
(See also specific elements concerned.)
compressibility parameters and Grüneisen's constants, 9: 1863
compression of, to 10,000 atmospheres at low temperature, 9: 6667(J)
conductometric determination by paper chromatography of chloride and perchlorate ions in, design and performance of apparatus for, 9: 2215(J)
melting, theory of, 9: 7388
nuclear spin relaxation in, 9: 5771(J)
rigid solution of, solvated electrons and radicals in, 9: 864(J)
separation by anion exchange using EDTA and Dowex-1 resins, 9: 2214(J)
surface energies and temperature coefficients, 9: 6669(J)
targets for accelerators from, preparation of, 9: 6088(J)
thermodynamic properties of Li, Na, K, Rb, and Cs, 9: 7282(J)
thermoelectric power in liquid ammonia, 9: 1911(J)
Alkaline earth halides
reaction with B_2O_3 to prepare B halides, 9: 598
Alkaline earth ions
elution behavior of, from sulfonic acid resins, 9: 5298(J)
Alkaline earth metals
(See also specific elements concerned.)
anion-exchange separation of, in citrate solutions, 9: 2213(J)
targets for accelerators from, preparation of, 9: 6088(J)
Alkaline earth oxides
europium-activated, infrared spectra, 9: 6618(J)
heat and free energy of formation, 9: 529(J)
Alkaline earth sulfides
europium-activated, infrared spectra, 9: 6618(J)
Alkaline earth uranates
crystal chemistry, 9: 2372(J)
Alkenes
radiation chemistry, 9: 2662(J)
Alkyl borates
infrared spectra, 9: 7259
Alkyl bromides
secondary and tertiary, isotopic exchange reactions in acetone, 9: 5593(J)
Alkyl chlorides
effects of radiation on, 9: 3888(R), 3889(R)
Alkyl fluorides
hydrolysis and stability of, 9: 893(J)
preparation of n-pentyl fluoride, 9: 2131
Alkyl halides
hydrolysis by H_2O and D_2O, rates of, 9: 2646(J)
isotopic exchange with halide ions, isomerization and double bond effects, 9: 6891(J)
Alkyl iodides, perfluoro-
synthesis of conversion to organometallic and organometalloid compounds, 9: 893(J)
Allanites
distribution of thorium in, 9: 6269(J)
Allegheny Formation (Penna.)
geology, 9: 164(J)
Allegheny Formation (W. Va.)
stratigraphy and occurrence of radioactive coal and shale in, 9: 6268
Allegheny Ludlum Steel Corp., Brackenridge, Penna.
progress reports on research and development of wrought and cast high-temperature alloys, 9: 3488(R)
Allegheny Ludlum Steel Corp., Research Lab., Waterolict, N. Y.
progress reports on wrought and cast high-temperature alloys, 9: 2720(R)
Alloys
(See also specific alloys and systems which are indexed with components arranged both in alphabetical and reversed orders.)
aircraft, thermal neutron gamma activation tables for, 9: 6508
binary, slide rule for converting atomic percent to weight percent, design and performance, 9: 3170
corrosion by liquid NaOH at 1000 and 1500°F, 9: 1508
corrosion resistance and applications of construction, survey and directo of, 9: 137(J)
cost ratings of various, 9: 2254(J)
diffusion and oxidation of, review, 9: 3206(J)
disordered, energy levels of, 9: 2777(J)
ferrous and nonferrous, atmospheric corrosion, 9: 3824
film formation, mathematical analysis, 9: 3884(J)
high temperature corrosion, review, 9: 4443(J)
intermediate phase studies and melting temperatures of Laves-type, 9: 2721(R)
intermediate phase studies and valence calculations of transition metals of Laves-type, 9: 2736
irradiation disordering of, mechanism, 9: 4012(J)
melting point of, as a remote temperature measuring device, 9: 2335
from metal carbides, properties, 9: 5945(J)
nuclear magnetic moments, 9: 2895
oxidation and corrosion, effects of alloying elements on, 9: 7011(J)
polarographic analysis, 9: 3402(J)
properties, treatment, preparation, and theory of, 9: 6288
radioactivity induced in, by pile radiation, 9: 6105
relaxation strength of, theory, 9: 1537
vacancies and energy of vacancy formation in, 9: 3525(J)
weld crack sensitivity of light, effects of separation stresses, form of separation of intermediate phases, shrinkage cavities, and unusual shrinking stresses on, 9: 196
x-ray analysis of microstructure of, electronic probe for, 9: 5992
zirconium, Hf, Ti, Pb, and Sn, chemical polishing, 9: 7990(P)
Alpha beams
capture by various targets, 9: 5761(J)
measurement of, from cyclotrons, 9: 6777
Alpha cross sections
for capture by various targets, 9: 5761(J)
Alpha decay
(See also subheadings regarding alpha emission under specific isotopes.)
of beryllium Be^8, angular correlation with Li^8 β particles, 9: 5819(J)
calculated wave amplitudes near the nucleus, 9: 2949
corrections in theoretical study of, due to presence of atomic electrons, 9: 6537(J)

Alpha decay (cont'd)
correlation of alpha energies with half lives, 9: 4705(R)
disintegration energy for heavy nuclei, formula, 9: 3692(J)
emission probability of atomic electrons due to, 9: 6532(J)
excitation of nuclear rotational levels in, 9: 6801(J)
fine structure, high-resolution ion pulse analyzer for study of, 9: 3595(J)
fine structure in, 9: 2502
fine structure of, of AcX*, 9: 6109(J)
half lives, correlation with spontaneous-fission half lives, 9: 362(J)
internal ionization from, of Po^{218}, 9: 6536(J)
relation to nuclear shell model, 9: 1999(J)
review, 9: 4020(J)
rotational level effects, 9: 7576(J)
of spheroidal nuclei, 9: 2136(R)
table of disintegration energies for heavy elements, 9: 806(J)
theory of, 9: 7191(J)
theory of, using a surface well potential, 9: 1125(J)

Alpha particles
(See also subheadings concerning alpha emission and alpha reactions under specific elements, isotopes, and compounds.)
in air, detection of, design of equipment, 9: 6686
analysis of binary gas mixtures by ion production due to, 9: 7053(J)
apparatus for counting α tracks in a photographic emulsion, 9: 4705(R)
in autoradiography, with liquid emulsions, 9: 7252(J)
biological effects of, compared with effects of x radiation, in mice, 9: 2564(J)
biological effects of, compared with effects of x radiation, on yeasts, 9: 3364
on boron, neutrons and protons from, 9: 5799(J)
chemical effects of, on aqueous solutions, 9: 580(J)
collision of high-energy, with nuclei, 9: 1667
in cosmic radiation, determination of, 9: 1007(J)
in cosmic radiation near geomagnetic equator, 9: 1292(J)
detection and measurement, performance of monitoring instruments, 9: 3268(J), 3933
detection and measurement, performance of portable battery-driven monitor, 9: 3933
detection and measurement of, by kinetic nucleography, 9: 713(J)
detection and measurement of, efficiency of various detectors for, 9: 5721(R)
detection and measurement of, from photonuclear reactions, 9: 1037
detection and measurement of, from U and Pu, 9: 1598
detection and measurement of, in air, instrument for, 9: 7856
detection and measurement of, in determinations of thickness, 9: 1236
detection and measurement of, instruments, and respiratory deposition and retention, 9: 4048
detection and measurement of, with scintillation detectors, 9: 697
detection of, with thin plastic scintillators, 9: 7455
detection with ZnS screens, 9: 3600(J)
directional correlations (α-γ), increased efficiency with liquid film sources, 9: 321(J)
disintegration energy of, for heavy nuclei, formula, 9: 3692(J)
dosimetry of, and effects on mitosis in grasshopper neuroblasts, 9: 7237(J)
effects on creep and hardness of Cd crystals, 9: 433(J)
effects on H_2O_2 and HCl-H_2SO_4 mixtures, inhibitory action of Cl^-, 9: 581(J)
effects on luminescence from Tl-activated and unactivated NaI and CsF crystals, 9: 5109

Alpha particles (cont'd)
effects on surface properties, 9: 2052(J)
elastic scattering of, by heavy nuclei, 9: 7511(J), 7903
elastic scattering of 22-Mev, from Ag, Au, and Pb, 9: 2937(J)
elastic scattering of 40-Mev, from Al, diffraction effects of, 9: 7329(J)
elastic scattering of 40-Mev, from heavy elements, 9: 7132(J)
elastic scattering of 48.2-Mev, from Ag and Au, 9: 7140(J)
elastic scattering of protons and deuterons by, 9: 410(J)
emission from granites, limestones, bentonites, building materials, ground waters, and plants, 9: 445(J)
emission of, from excited nuclei by protons of 50, 100, 150, and 450 Mev, 9: 2917(J)
emission of, generalization of the Bateman-Poisson law for the time correlated, 9: 7195(J)
energy levels of, from H^3 + p reaction, 9: 741(J)
energy-momentum tables, 9: 402
floor monitor for, design, 9: 302
fluorescence induced by, bombardment, 9: 7494(R)
inactivation of poliomyelitis virus with, 9: 3737(J)
increased sensitivity of photographic detection of, 9: 7458(J)
interaction of 350-Mev, in nuclear emulsions, 9: 5780(J)
interactions in nuclear emulsions, 9: 3966(R)
ionization in pure gases by, determination of average energy to produce ion pairs, 9: 3899(J)
ionization of A, CO_2, and N_2, 9: 1994(R), 4266(R)
ionization of argon by 5-Mev, 9: 780(J)
ionization of gases by, 9: 2539(R), 2821
multiple scattering of low energy, 9: 6791(J)
neutron scattering by, determination of spin-orbit interaction in, 9: 6795(J)
nuclear interaction of He nuclei in cosmic radiation, 9: 4494(J)
oxidation and reduction of ceric salts by, 9: 1215(J)
oxidation and reduction of cerous-ceric system by, role of oxygen radicals in, 9: 1214(J)
oxidation of phosphite ions by, 9: 582(J)
from proton reactions $p + O^{18} \rightarrow p + 2\alpha + Be^8$, 9: 6069
radiative capture of, from 1.2 to 2.2 Mev, in N^{14}, 9: 6490(J)
radiation hazards from, in laboratory, control, 9: 4049
from radon, detection in air, 9: 4510
from radon and its daughters, detection of, performance of scintillation detectors for, 9: 6820(R)
from radon in air, detection and measurement, 9: 6402
range and straggling in liquids, method for measuring, 9: 4536(J)
range-energy relation for slow, in argon, 9: 4615(J)
ranges and straggling of low-energy, in air, 9: 782(J)
ranges in materials, prediction, 9: 2928
relative biological effectiveness of, in mammalian systems, compared with effects of other radiations, 9: 3007
scattering of 19-Mev, from Al and Cu foils, 9: 7522(J)
scattering of Po, by hydrogen, 9: 1379(J)
scattering phase shift calculation for α-γ scattering by ILLIAC computer, 9: 1395(J)
spallation of silver by 550-Mev, cross sections and yields, 9: 7940(J)
stability of, and application to the α particle model, 9: 5763(J), 5764(J)
star production by 380-Mev, 9: 6035(R)
stopping by water films and water vapor, 9: 3311(J)
track counter for, 9: 6094

Alpha sources
apparatus giving α-particle microbeam for irradiation of living cells, 9: 2397(J)
beta-alpha decay of Li^8, from 1 to 6.5 Mev, 9: 6120(J)
catalog of, 9: 246(J)

Aluminum
absorption of β particles in, and relation to surface counting for diffusion measurements, 9: 4000(J)
absorption of monoergic electrons in, 9: 791(J)
absorption of O_2 on evaporated films of, 9: 2159(J)
aging and relaxation coefficients, relation to plastic deformation, 9: 5377(J)
analysis of, for Na using flame photometer, 9: 6904(J)
angular distribution and cross sections for scattered neutrons, 9: 3993(R)
angular neutron elastic scattering cross sections at 2.7 Mev, 9: 4595(J)
anodic film formation, theory, 9: 1194(J)
attenuation cross sections for 660-Mev protons, 9: 7172(J)
attenuation of broad beam 70 to 250 kvp x radiation by, 9: 2046(J)
bombardment of with heavy ions, Ce^{38}/Cl^{34} ratio from, 9: 6061(J)
bonding to itself and to cotton and glass fabric plastic laminates, effects of temperature on, 9: 651
carbon impurity in, micro-determination of, 9: 6314(J)
casting, earing during, 9: 6327(J)
cathodic sputtering, electron microscope study, 9: 2743(J)
charge equilibrium ratios for H ions from proton bombarded, 9: 2486(J)
chemical analysis, review, 9: 4200(J)
choice and construction of monolithic linings for twin-bath induction furnaces for melting, 9: 3195(J)
colorimetric determination of, in Florida leached zone material, 9: 880
combustion at subatmospheric pressures in O_2 and in air, equipment for, 9: 3498(R)
complexometric titration, 9: 4078(J)
compressibility parameters and Grüneisen's constants, 9: 1863
compressive, bearing, and shear creep-rupture properties of, at elevated temperatures, 9: 5361
continuous flash annealing, 9: 1891(J)
control of quality in heat treatment and final operations in production of rolled, extruded, and drawn, 9: 3193(J)
corrosion, development of coating and pretreatment for inhibition of, 9: 947(R)
corrosion, effects of surface state on, 9: 6325(J)
corrosion, protection against by use of boehmite layers, 9: 6264(J)
corrosion by Bi–Pb–Sn alloy at elevated temperatures, 9: 6659
corrosion by HCl, influence of purity on, 9: 6326(J)
corrosion by hydraulic fluids, 9: 2795(R)
corrosion by water, effects of high-level γ radiation and temperature on, 9: 7755
corrosion by water at high temperatures, effects of cold-working and cold-working and annealing on, 9: 2252
corrosion by wet and dry Cl_2 between 260 and 300°, 9: 158(J)
corrosion in high-temperature water, effects of corrosion inhibitors and alloying, 9: 6091
corrosion of, and stainless steel–Al couples by water, inhibition with Na dichromate-chloramine mixture, 9: 153
corrosion pits and metallic inclusions in, detection of, by colorimetric spot tests, 9: 1196
corrosion resistance and industrial applications, review, 9: 7367(J)
corrosion testing, methods for cleaning exposed specimens for, 9: 952(J)
cosmic showers under, production, 9: 4489
creep, effect of alloying and cold work on activation energy for, 9: 5961
creep, tertiary stage of, 9: 203(J)
creep of, at high temperatures, activation energy for, 9: 2733
creep of, effects of structure on, at high temperatures, 9: 2732
creep of, during neutron irradiation, 9: 1120(J)
cross sections for neutron transmission and multiplication, 9: 3646(J)
damping and elasticity properties, 9: 7746
determination of P in, by neutron activation analysis, 9: 5891(J)
determination of small amounts in steel by spectrochemical method, 9: 2171(J)
differential neutron elastic scattering cross sections at 4.1 Mev, 9: 4597(J)
disintegration by 0.4- to 3.0-Bev protons, 9: 6074(J)
dissolved in NaF–KF mixture, relative position in the electrochemical series of, 9: 6310(J)
distribution of products of heavy ion reactions with, 9: 3305(J)
drawing of sheet, formation of ears during, 9: 6328(J)
drawing of sheet, isotropy and ear formation in, 9: 6329(J)
effects of H on, 9: 1272(J)
elastic scattering of α particles, 9: 7893(R)
elastic scattering of 40-Mev α particles from, diffraction effects, 9: 7523(J)
elastic scattering of high-energy polarized protons by, 9: 4885
elastic scattering of polarized protons from, 9: 4893(J)
electrochemical corrosion, theory, 9: 3825
electrochemical removal of aluminum oxide films from surface of, 9: 6959(J)
electrode potentials, corrosion, electrochemical behavior, and dissolution of, in various solutions, 9: 4143(J)
electroforming Cu on inside of funnels of, 9: 3495
electrolytic polishing, 9: 4189(J)
electron absorption and transmission in, 9: 6367(J)
electron and positron scattering by, at 0.7 and 1.4 Mev, 9: 4611(J)
electron emission from, bombarded by hydrogen ions, 9: 250(J)
electron energy losses in thin foils of, 9: 5790
electropolishing, effect on surface properties, 9: 5379(J)
emission of secondary electrons (δ rays) by 1.3-Mev electron bombardment, 9: 1306(J)
energy loss of secondary electrons in a cavity with walls of, 9: 2045(J)
exaggerated grain growth of extruded, 9: 1545
external bremsstrahlung emitted from P^{32} β rays stopped in, 9: 2505(J)
extrusion techniques for, bibliography, 9: 3482
evaporation as subhalide and production of pure, 9: 6311(J)
fatigue of ductile, at ranges of stress extended to compression, 9: 5962
fluorimetric determination of, in mixtures of Al and Ga oxinates, 9: 5269(J)
gamma absorption by, direct measurement of energy of, 9: 7462(J)
gamma albedos, Monte Carlo calculations of, 9: 5516(J)
gamma penetration, tables and graphs, 9: 2472
gamma scattering in, calculated by Monte Carlo method, 9: 6500
gravimetric and spectrochemical determinations of, in Ti and Ti alloys, 9: 4944
heat-transfer resistance between U and, 9: 4435(J)
impurities in super-purity, analysis of, 9: 6313(J)
inert-gas welding of, for aircraft parts, 9: 6301(J)
influence of substructure on slip when subjected to fatigue stresses, 9: 2371(J)
intercrystalline grains in, growth of, determined by the method of microhardness, 9: 642(J)
intergranular corrosion of, by hydrochloric acid, effects of heat treatment, iron content, and acid composition, 9: 2706

Aluminum (cont'd)

intergranular corrosion of high-purity, by hydrochloric acid, grain-boundary segregation of impurity atoms in, 9: 3826

interpretation of etch patterns on, 9: 7019(J)

lattice constants, 9: 3408

μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)

metabolism of, as a substitute for B, by plants, 9: 3(R)

metallurgy, research and technical progress in U.K. and U.S.A. 1954, on, 9: 2775(J)

neutron absorption and total cross sections at 1.4 Bev, 9: 5486(J)

neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)

neutron irradiation effects in, at 80°K, 9: 4622(J)

neutron reactions (n,π^0), 400 Mev cross section, 9: 5742(J), 6011(J)

neutron reactions $(n,n\gamma)$ at 4.5 Mev, γ rays from, 9: 4589(J)

neutron reactions $(n,n\gamma)$, γ spectra from, 9: 4598(J)

neutron scattering, energy distribution measurements, 9: 7386

neutron total cross sections, 9: 7124(J)

nuclear electric quadrupole interactions in, 9: 3189(J)

nucleon total scattering cross sections, 9: 3673(J)

number of vacancies and energy of vacancy formation in, 9: 3525(J)

oxidation and corrosion, effects of alloying elements on, 9: 7011(J)

photon reactions (γ,n), 250 Mev, 9: 6772(J)

photonuclear reactions, 9: 2449(J)

pitting corrosion, use of radioactive tracers in, 9: 2257(J)

pitting probability, influence of specimen area on, 9: 7810(J)

polarization, corrosion, and erosion-corrosion in fuming nitric acid from room temperature to 160°F, design and performance of equipment for testing, 9: 2255(J)

polishing of, with alumina abrasives, technique, 9: 3879(J)

porosity of, calculated by repetitive oscillographic method in various electrolytes, 9: 7012(J)

powder metallurgy, 9: 2716(R), 4163(R), 4164(R), 4165(R)

pressure-compression data for, from shock wave measurements, 9: 3876(J)

production of negative H ions by 11.5- to 28-kev protons in, 9: 6789(J)

production of μ meson pairs by 345-Mev bremsstrahlung, 9: 1336(J)

properties, effect of annealing temperatures and degree of deformation on, 9: 5378(J)

properties and reactor applications, 9: 6476

proton-proton coincidences in, produced by 340-Mev γ rays, 9: 7556(J)

proton reactions (p,n), angular distributions and yields at 23 Mev, 9: 4290(J)

proton total cross sections at 208 and 315 Mev, 9: 358(J)

purification by "zone melting," 9: 6312(J)

radiation measurements on oxy-aluminum flame at elevated pressures, equipment for, 9: 3498(R)

radioactivity induced in by pile radiation, 9: 6105

radiographic inspection, evaluation of Polaroid process for, 9: 143

radiography with Tm^{170}, 9: 2241(J)

range-velocity relation for fission fragments, 9: 1365(J)

recovery and recrystallization, relationship between, 9: 7010(J)

recovery from Florida leached zone materials, cost factors, 9: 7257

rolling and recrystallization textures of plates of, 9: 6316(J)

scattering of molecules from surface of, 9: 650

scattering of 19-Mev α particles from foils of, 9: 7522(J)

scattering of 0.6, 1.0, and 1.7 Mev electrons from, 9: 2485(J)

secondary electrons from, for primary electrons of 20 kev to 1.3 Mev, 9: 5989(J)

Aluminum (cont'd)

separation and determination of, in Al–Th mixtures, 9: 5368(J)

spallation products of, from 5.7-bev proton bombardment, 9: 7272(R)

separation from Zr by ion exchange, 9: 4754

slip band extrusion effect in cold-rolled super purity, 9: 4803

soldering and corrosion of soldered joints in 95°C, low-conductivity, aerated, distilled water, 9: 2725

solubility in liquid Al–Si, 9: 1871(J)

solubility of, in molten AlI_3, 9: 3052

spectrographic determination in Al–Zr alloys, 9: 6195

spectrographic determination in Ti and Ti alloys, 9: 639(R)

spot welding of, without slope control and regulator, 9: 219(J)

stress relaxation, 9: 3192(J)

stress values of, chart and nomograph for, 9: 3441(J)

sub-grain formation in, deformed at −183°C, 9: 3190(J)

substructure of fine-grained, x-ray study of, 9: 1208(J)

super-purity, production, properties and applications, 9: 2774(J)

tensile and creep testing, 9: 3865(R)

tensile-creep testing at high temperatures, 9: 3163

tensile strength and corrosion by water of soldered joints, 9: 193(J)

three-quantum annihilation of positrons in, 9: 249(J)

ultrasonic tinning and soldering, 9: 193(J)

ultrasonic welding of, 2S, 9: 5352

volumetric determination of, with EDTA using hematoxylin as indicator, 9: 3403(J)

welding of, for H_2O_2 service, 9: 3512

welding of, in inert atmosphere, 9: 6330(J)

welding of, survey and bibliography, 9: 1851(R)

welding of sheets of, by oxy-acetylene process, 9: 221(J)

x-ray absorption, 9: 4524(J)

Young's modulus, effects of cold deformation on, 9: 2769(J)

Aluminum (clad)

heat treatment in molten $NaNO_3$ without staining, 9: 1891(J)

Aluminum (liquid)

corrosive effects on steel, inhibition with Al oxide coatings, 9: 191

explosions with water, prevention of, 9: 1743

Aluminum alloys

bending and torsion fatigue tests of 25S-T6, effects of stress in, 9: 1846

colorimetric analysis of, for Fe, 9: 5600(J)

containing Mn, Cu, Mg, Zn, Fe, Cr, Ni, Ca, Ti, Pb, or Si, spectrographic analysis, 9: 3513

continuous flash annealing, 9: 1891(J)

control of quality in heat treatment and final operations in production of rolled, extruded, and drawn, 9: 3193(J)

corrosion, 9: 7155(J)

corrosion in high-temperature water, 9: 6991

corrosion of heat exchangers of, exposed to various inorganic and organic materials, 9: 950(J)

corrosion of 3S-0 and 52S-0, by alternate exposure to liquid and gaseous fluorine, 9: 4142

corrosion resistance and industrial applications, review, 9: 7367(J)

corrosion testing, methods for cleaning exposed specimens for, 9: 932(J)

coupled to Ti and Zr, galvanic corrosion of, in H_2SO_4 solutions, 9: 3151(J)

creep, intercrystalline fracture, and grain structure, 9: 4456

creep properties of, review, 9: 6321(J)

creep properties of 75S-T6 at 450°F, effect of intermittent loading and heating, 9: 5062

creep-rupture properties of 6061-T6, at 450 and 500°F, 9: 1854

Aluminum alloys (cont'd)
curved-crystal x-ray spectrometric microdeterminations of Fe and Mn in, 9: 3435(J)
determination of Zn in, 9: 5886
mechanical properties, effects of temperature and unstable microstructure on, 9: 3510
electrochemical removal of aluminum oxide films from surface of, 9: 6959(J)
electrolytic polishing, 9: 4189(J)
equipment and techniques for column creep tests, thermal properties, 9: 6996
fabrication of, by utilization of powder metallurgy techniques, 9: 5354(R)
fatigue, effects of microstructure and anisotropy on, 9: 3171
fatigue and tensile properties, anisotropy of, in bending and in torsion, 9: 4158
fatigue behavior of, effects of notch size on, 9: 173
fatigue damage of axially loaded, 9: 6995
fatigue life of, for hydraulic systems, 9: 6641
fatigue of ductile, at ranges of stress extended to compression, 9: 5962
fatigue phenomena in high-strength, 9: 2322(J)
fatigue strength of, 9: 214(J)
fatigue strength of, effects of elevated temperature on, 9: 3846(R), 3855(R)
fatigue under ranges of stress, 9: 4157, 4159
flash welding of, mathematical analysis of temperature distribution during, 9: 5373(J)
grain growth, discussion of abnormal, 9: 6317(J)
influence of substructure of on slip when subjected to fatigue stresses, 9: 2371(J)
mechanical properties, effects of forging on, 9: 7358
mechanical properties, effects of high heating rate on, 9: 3511
mechanical properties, effects of neutron flux on, 9: 799
microradioautographic technique for, 9: 5440(J)
neutron-activation analysis of, for Na, 9: 1204(J)
oxide coatings on, effects on properties, 9: 3519
photometric determination of zirconium in, 9: 3545(J)
polarization, corrosion, and erosion-corrosion in fuming nitric acid from room temperature to 160°F, design and performance of equipment for testing, 9: 2255(J)
powder metallurgy, 9: 3846(R), 3855(R)
properties and reactor applications, 9: 6476
riveted and welded joints of, creep and creep-rupture characteristics, 9: 5356
single-phase resistance spot welding of 38H14, 52SH34, 61ST6, and 24ST3, schedules and equipment for, 9: 2313(J)
sintered, effects of elevated temperature on fatigue strength of, 9: 3164
solubility in liquid Al–Si, 9: 1871(J)
spectrochemical analysis of, for Mg and Be, 9: 7701(J)
spot welding of thin, 9: 219(J)
stress corrosion, 9: 4442(J)
structural changes of, observed by electron diffraction, 9: 6322(J)
surface polishing of, 9: 173
tensile properties, 9: 3521
tensile properties, ductility, and yield strength of, effects of neutron radiation on, 9: 5973(J)
tensile properties, effects of temperature on, 9: 5960
tensile properties of DTD 546 and DTD 687, 9: 4802
welding of, by semiautomatic inert-gas metal-arc process, 9: 3508
welding of, survey and bibliography, 9: 1851
welding of 75S, multi-arc process for, 9: 3167
welds, static and fatigue properties, 9: 5370(J)

Aluminum alloys (Al clad)
fatigue tests of seam-welded, 9: 3500

Aluminum alloys (clad)
bonding to itself and to cotton and glass fabric plastic laminates, effects of temperature on, 9: 651
creep properties of, under intermittent stressing and heating conditions, 9: 3521
creep properties under intermittent heating, 9: 5664
heat treatment in molten $NaNO_3$ without staining, 9: 1891(J)

Aluminum alloys (liquid)
effects of ultrasonics on, 9: 5065

Aluminum–aluminum oxide–nickel systems
microstructure, density, ductility, and stress-rupture, 9: 4166(R)

Aluminum–aluminum oxide systems
mass spectrographic study of gaseous species in, 9: 2842(J)

Aluminum–beryllium alloys
alloying effect of Be on properties of, 9: 982(J)

Aluminum–beryllium–iron alloys
crystal structure, 9: 2310(J)

Aluminum bromides
viscosity and electrical conductivity relationship in solutions of, 9: 1748(J)

Aluminum bronze
(See also Aluminum–copper alloys.)
corrosion by chlorinated and alkalized boiler water and pure deionized water, 9: 3168
stress corrosion of cylinder valves of, 9: 3149(J)

Aluminum–cadmium alloys
creep, activation energies for, 9: 5961

Aluminum–cadmium–copper alloys
metallurgy, corrosion behavior, and applications, 9: 6324(J)

Aluminum–calcium alloys
as container material for Ti, evaluation, 9: 4780

Aluminum–carbon–titanium systems
mechanical properties, 9: 3854(R)

Aluminum–carbon–titanium–vanadium systems
tensile properties, 9: 3853(R)

Aluminum chloride–lithium chloride systems (liquid)
electric conductivity, 9: 2613

Aluminum chloride–potassium chloride systems (liquid)
electric conductivity, 9: 2613

Aluminum chloride–rubidium chloride systems (liquid)
electric conductivity, 9: 2613

Aluminum chloride–sodium bromide systems (liquid)
electric conductivity, 9: 2613

Aluminum chloride–sodium chloride systems (liquid)
chemical reactions, constitution diagrams, self-diffusion, and electric conductivity, 9: 2613

Aluminum chlorides
purification, 9: 2613

Aluminum–chromium–manganese alloys
crystal structure, 9: 2373(J)

Aluminum–chromium–molybdenum–titanium alloys
phase structures and tensile properties of as-produced, 9: 2279(R)

Aluminum–chromium–nickel–titanium alloys
surface chemistry of oxidized, 9: 2747(J)

Aluminum–chromium–titanium alloys
tensile properties and microstructure, effects of heat treatment on elevated-temperature, 9: 2719(R)

Aluminum–chromium–titanium alloys (cont'd)
fabrication, 9: 1534
fabrication and physical properties, 9: 2717(R)
fabrication of joints by pressure welding, 9: 5974(J)
hardness, crystal structure, and phase studies, 9: 3520
hardness, heat treatment, and microstructure, 9: 4186
impact strength and hardness of weld thermal-cycled heat-affected zone of, 9: 1531
microstructure and continuous cooling transformation of, 9: 1531
transformation characteristics, microstructure, heat treatment, and mechanical properties, 9: 4807(R)

Aluminum coatings
spraying of, on iron and steel for corrosion prevention, 9: 3150(J)
on steel, corrosion and weldability of, 9: 171

Aluminum–cobalt–molybdenum alloys
oxidation at 954°C, 9: 3146

Aluminum complexes
with acetylacetone, infrared spectra, 9: 6873(R)

Aluminum compounds
polarographic behavior of, in molten ammonium formate, 9: 7292
preparation, properties, and chemical reactions of Al_2O_3 and $Al(OH)_3$, 9: 6885(J)
preparation and polymerization, 9: 6873(R)
thermal decomposition of aluminum isopropoxide, 9: 6873(R)

Aluminum–copper alloys
(See also Aluminum bronze.)
creep, activation energies for, 9: 5961
creep and tensile properties of, effects of alloying element on, 9: 6295(J)
creep of, effects of structure on, at high temperature, 9: 2732
creep of, grain-boundary movement, slip, and fragmentation during, 9: 2321(J)
electrolytic polishing, 9: 4189(J)
fatigue strength, 9: 5060
fatigue testing in different stress ranges, 9: 5061
intercrystalline corrosion, due to aging, 9: 4143(J)
magnetic susceptibility and change of state on tempering, 9: 4192(J)
precipitation phenomena in, influence of cold rolling after quenching on, 9: 6318(J)
relaxation effects in solid solutions of, arising from changes in local order, 9: 204(J)
relaxation strength, 9: 1537
single crystals, preparation and plastic deformation, 9: 5668(J)
stress, temperature effects on, 9: 5668(J)
structural changes of observed by electron diffraction, 9: 6322(J)
surface energy, 9: 6286(R)

Aluminum–copper couples
preparation and grain-boundary diffusion, 9: 971(R)
solid state bonding, tensile properties, and intermetallic penetration, 9: 6303(J)

Aluminum–copper–magnesium alloys
aging characteristics, 9: 2323(J)
fatigue testing in different stress ranges, 9: 5061

Aluminum–copper–magnesium–manganese alloys
corrosion, effects of heat treatment on, 9: 4143(J)
exaggerated grain growth of extruded, 9: 1545(J)
fretting corrosion, fatigue, surface friction, 9: 6262

Aluminum–copper–magnesium–silicon systems
constitution diagrams at 460°C, 9: 6298(J)

Aluminum–copper–magnesium–zinc alloys
fatigue testing in different stress ranges, 9: 5061

Aluminum–copper–nickel alloys
diffusionless phase transformation, crystal structure, heat treatment, and thermal expansion, 9: 1861(R)

Aluminum–copper–silicon systems
corrosion resistance and mechanical properties of, effects of variation of zinc content on, 9: 3541(J)
effects of vibration on solidification, 9: 3851

Aluminum–copper–zinc alloys
spiral substructures in β phase, 9: 1881(J), 1882(J)

Aluminum crystals
internal friction of, effects of annealing and plastic deformation on, 9: 5054
plastic deformation at various temperatures, shear properties, tensile properties, surface defects, and electron microscopy, 9: 5660
plastic deformation of, at elevated temperatures, 9: 3863
production, 9: 1548
recrystallization of, surface nucleation in, 9: 2370(J)
single, lineage structure in, 9: 7009(J)
substructures in single, determination by means of x rays, 9: 4816(J)

Aluminum fluorides
crystal structure, 9: 6912(J)

Aluminum foils
continuous annealing without crinkling, 9: 1891(J)
energy loss distributions of 1-Mev electrons in, 9: 5519(J)
preparation of, for use as radiation absorbers, 9: 7453
preparation of thin single crystal, having desired crystallographic orientations, 9: 5673(J)

Aluminum–germanium alloys
creep, activation energies for, 9: 5961

Aluminum hydrides
preparation of, by reaction with atomic H, 9: 635(R)

Aluminum hydroxides
aging, mechanism, 9: 5911(J)
aging, x-ray spectrographic study of, 9: 5385(J)
preparation of, by precipitation through seeding with hydragillite, 9: 2680(J)

Aluminum–indium–titanium alloys
hardness, crystal structure, and phase studies, 9: 3520

Aluminum iodides (liquid)
solubility of Al in, 9: 3052

Aluminum ions
hydrolysis of Al^{+3}, mathematical analysis, 9: 2621(J)

Aluminum–iron alloys
crystal structure, 9: 2311(J)
thermodynamic properties, 9: 2294(R)

Aluminum–iron–molybdenum alloys
corrosion by water, 9: 6946(R)

Aluminum–iron–silicon systems
equilibrium diagram of, established by liquation, 9: 6323(J)

Aluminum–iron–titanium alloys
fabrication and physical properties, 9: 2717(R)
hardness, crystal structure, and phase studies, 9: 3520

Aluminum isotopes Al^{26}
decay scheme, 9: 2997(J)
half life and activities, 9: 5533(J)

Aluminum isotopes Al^{25}

beta transformations and activity of, 9: 6540(J)

energy levels, 9: 7914(J)

proton capture, positrons from, 9: 5817(J)

Aluminum isotopes Al^{26}

decay, β and γ spectra of isomeric, 9: 7127(J)

detection and decay of, 9: 1681(J)

nuclear properties, 9: 3302(J), 3303(J)

observation of 6.7-sec isomeric state, 9: 2064(J)

Aluminum isotopes Al^{27}

activation determination with α source, 9: 1650

alpha reactions (α,p), angular distribution of protons from, 9: 2913

deuteron reactions (d,d), 9: 1066(R)

deuteron reactions (d,p), 9: 2331(R)

energy levels, 9: 739(J)

energy levels by inelastic scattering of 15-Mev neutrons, 9: 4561(J)

gamma reactions (γ,2α2p), N^{17} yield curve from, 9: 3644

neutron reactions (n,p), 9: 798(J)

nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)

nuclear spin-lattice relaxation time, 9: 5774(J)

nuclear resonance absorption spectrum of, in euclase single crystal, 9: 5470(J)

proton reaction (p,n), threshold value in, 9: 7551(J)

proton reaction (p,3pn), cross section, 9: 4286

proton reactions (p,α), 9: 1359(J)

proton reactions (p,γ), energies from, 9: 3984(J)

scattering of protons by and energy levels of, 9: 2484(J)

Aluminum–lithium–magnesium alloys

magnesium-rich corner of 100, 200, 375°C isothermal sections of, 9: 2760(J)

phase relations in, 9: 3166, 3481, 3484(R)

Aluminum–magnesium alloys

chemical analysis and creep resistance, 9: 4161(R)

compression strength properties, 9: 3865(R)

creep, activation energies for, 9: 5961

creep of, effects of structure on, at high temperature, 9: 2732

creep of, grain-boundary movement, slip, and fragmentation during, 9: 2321(J)

creep testing at 300° to 600°F and microstructure, 9: 5050

electrolytic polishing, 9: 4189(J)

flow and fracture strength of α solid solutions of, effects of temperature and grain size on, 9: 3172(R)

foaming in crucibles, effects of ZrH_4 additions on, 9: 191

formation of foamed metal low-density core material of, for sandwich construction, design of equipment for, 9: 3182

formation of low-density foams of, methods and equipment for, 9: 3181

interaction of precipitation, solid-solution content, and creep in, 9: 1270

intercrystalline corrosion due to aging, 9: 4143(J)

sand casting of, development of inhibitors, review, 9: 3476

soft x-ray spectra, 9: 3697(J)

weld crack sensitivity in, effects of separation stresses, form of separation of intermediate phases, shrinkage cavities, and unusual shrinking stresses on, 9: 196

Aluminum–magnesium–manganese alloys

weld crack sensitivity in, effects of separation stresses, form of separation of intermediate phases, shrinkage cavities, and unusual shrinking stresses on, 9: 196

Aluminum–magnesium–silicon systems

electrolytic polishing, 9: 4189(J)

heat treatment of, and relation to behavior of Si in, 9: 6319(J)

mechanical properties, effects of Na on, 9: 5957

Aluminum–magnesium–zinc alloys

precipitation, textural phenomena occurring during, 9: 6315(J)

stress corrosion of, due to $MgZn_2$, 9: 4143(J)

Aluminum–manganese–titanium alloys

analysis of, for H, 9: 3077(J)

casting and mechanical properties of as-cast and wrought, 9: 184

compression properties and microstructure, 9: 3475

fabrication, heat treatment, phase studies, mechanical properties, microstructure, and aging characteristics, 9: 1856

hardness, crystal structure, and phase studies, 9: 3520

high-temperature tensile properties of annealed sheet and bar, 9: 3198(J)

machining and grinding, 9: 4174

mechanical properties and microstructure of flash-welded, 9: 964

phase studies and microstructure, 9: 1873(J)

transformation characteristics, microstructure, heat treatment, and mechanical properties, 9: 4807(R)

transformation temperatures, age hardening heat treatment, and mechanical properties, 9: 1534

Aluminum–molybdenum alloys

as container material for Ti, evaluation, 9: 4780

crystal structure, 9: 2373(J)

Aluminum–molybdenum–titanium alloys

creep and tensile properties of as-forged and heat-treated, effect of structure on, 9: 2279(R)

hardness, crystal structure, and phase studies, 9: 3520

melting techniques and forging temperatures for preparation of, 9: 1850(J)

tensile properties and microstructure, effects of heat treatment on elevated-temperature, 9: 2719(R)

Aluminum–nickel alloys

corrosion-resistant properties in high-temperature water, 9: 6991

high-temperature strength, effects of Mo, $MoCl_2$ and Li on, 9: 3485

microstructure, density, ductility, and stress-rupture, 9: 4166(R)

powder metallurgy and properties, 9: 3485

Aluminum–nickel–titanium alloys

hardness, crystal structure, and phase studies, 9: 3520

preparation, sintering, density, resistivity, percent O_2, stress-rupture, and impact strength of hot-pressed, 9: 3165(R)

stress-rupture of sintered, 9: 3850(R)

Aluminum–nickel–zirconium alloys

preparation, density, resistivity, stress-rupture, and transverse rupture strength of hot-pressed, 9: 3165(R)

Aluminum–niobium–titanium alloys

hardness, crystal structure, and phase studies, 9: 3520

oxidation, 9: 3849(R)

Aluminum–nitrogen–titanium systems

mechanical properties, 9: 3854(R), 4789(R)

Aluminum oxide–aluminum–nickel systems

microstructure, density, ductility, and stress-rupture, 9: 4166(R)

Aluminum oxide–aluminum systems

mass spectrographic study of gaseous species in, 9: 2842(J)

Aluminum oxide–calcium oxide–silicon oxide systems

electrolysis of slags of, containing S, 9: 2135(R)

Aluminum oxide–chromium compacts

vibratory compacting, 9: 4173(R)

Aluminum oxide coatings

on steel for inhibition of corrosion by molten Al, 9: 191

Aluminum oxide compacts

thermal rupture of, effects of porosity on, 9: 1507(J)

vibratory compacting, 9: 4173(R)

Aluminum oxide crucibles

preparation and properties of, for molten Ti, 9: 2246

Aluminum oxide films

electrochemical removal from Al and Al alloy surfaces, 9: 6959(J)

as a protective coating during Al corrosion, 9: 4143(J)

Aluminum oxide–nickel systems

interfacial energy, effect of Ti and Cr additions on, 9: 4777(R)

surface and interfacial energy at elevated temperatures, 9: 7752(R)

Aluminum oxide systems

creep and recrystallization, effects of temperature, additives, and preparation on, 9: 2731

Aluminum oxide–titanium oxide systems

thermal expansion, 9: 3844(R)

Aluminum oxide–titanium systems

hardness and microstructure, 9: 2246

powder metallurgy, 9: 3496

Aluminum oxides

abrasive uses for polishing metals, 9: 3879(J)

adsorptive capacity of, to be used in adsorption separation processes, 9: 6229(J)

determination of P in, by neutron activation analysis, 9: 5891(J)

electrical and mechanical properties, measurements in 3 cm wavelength region, 9: 3962

flotation studies using bubble pick-up technique, 9: 4722(J)

gas chromatographic elution of gases and volatile liquids from H_2, N_2, or CO_2, 9: 2672(J)

heat and free energy of formation, 9: 529(J)

potentials of, in NaOH and HCl solutions, 9: 4980

preparation, properties, chemical reactions, and technical applications, 9: 6885(J)

properties of, effect of molten Ti on, 9: 2246

reaction of Th with, at high temperatures, 9: 1247

sintering of, at 1650°C in various atmospheres, 9: 5388(J)

streaming potentials of, in solutions of HCl and NaCl, 9: 623(R)

Aluminum–oxygen–titanium systems

mechanical properties, 9: 3854(R), 4789(R)

tensile properties and microstructure, effects of heat treatment on elevated-temperature, 9: 2719(R)

Aluminum phosphides

preparation of, for neutron diffraction studies, 9: 3755

Aluminum powders

extrusion and surface area measurements, 9: 4163(R)

preparation, 9: 5354(R)

Aluminum–silicon systems

soft x-ray spectra, 9: 3697(J)

Aluminum–silicon systems (liquid)

solubility of solid Al and Al alloys in, 9: 1871(J)

Aluminum–silicon–titanium systems

hardness, crystal structure, and phase studies, 9: 3520

melting techniques and forging temperatures for preparation of, 9: 1850(R)

phase studies and hardness of, 9: 1843(R)

tensile properties of as-forged, 9: 2279(R)

Aluminum–silicon–titanium systems (cont'd)

tensile properties and microstructure, effects of heat treatment on elevated-temperature, 9: 2719(R)

transformation temperatures, age hardening, heat treatment, and mechanical properties, 9: 1534

Aluminum–silicon–zinc systems

corrosion of, in 95°C, low-conductivity, aerated, distilled water, 9: 2725

Aluminum–silver alloys

age-hardening of, in thin layers, 9: 2782(J)

constitution diagrams, electric conductivity, and thermodynamic properties, 9: 5661

intercrystalline grains in, growth of determined by the method of microhardness, 9: 642(J)

thermodynamic properties and phase studies, 9: 2294(R)

thermodynamic properties and x-ray measurements of various phases of, 9: 972(R)

Aluminum–silver–titanium alloys

oxidation, 9: 3849(R)

Aluminum–stainless steel couples

polarization, corrosion, and erosion-corrosion of galvanic, in fuming nitric acid from room temperature to 160°F, design and performance of equipment for testing, 9: 2255(J)

Aluminum–tantalum–titanium alloys

hardness, crystal structure, and phase studies, 9: 3520

oxidation, 9: 3849(R)

Aluminum–thorium alloys

analysis of, for Al and Th, 9: 5268(J)

analysis of, for Th, 9: 1759

crystal structure, 9: 3237(J)

crystal structure of AlTh, $AlTh_2$, and Al_7Th_4, 9: 4473(J)

Aluminum–tin–titanium alloys

hardness, crystal structure, and phase studies, 9: 3520

high-temperature tensile properties of annealed sheet and bar, 9: 3198(J)

spot welded joints in, 9: 1839(R)

Aluminum–tin–titanium–vanadium alloys

fabrication and physical properties, 9: 2717(R)

Aluminum–tin–zinc alloys

corrosion in 95°C, low-conductivity, aerated, distilled water, 9: 2725

Aluminum titanates

heat capacities and entropies at 298.16°K, 9: 4374(J)

heat content of, up to 1803°K, 9: 4375(J)

preparation and refractory properties, 9: 3844(R)

Aluminum–titanium alloys

casting and mechanical properties of as-cast and wrought, 9: 184

casting and powder metallurgy, 9: 3849(R)

creep and rupture behavior at 600 to 1000°F, 9: 3483

creep and tensile properties of as-forged, effect of structure on, 9: 2279(R)

creep deformation of, 9: 175(R)

creep-rupture tests in He atmosphere, 9: 5341(R)

determination of the $\alpha + \beta$ phase in, 9: 7378(J)

fabrication, heat treatment, and effect of microstructure on mechanical properties of, 9: 178

fabrication, mechanical properties, oxidation, and powder metallurgy, 9: 3520

heat of formation, 9: 7814(J)

hot-rolled textures and deformation mechanisms of, 9: 1836(R)

Aluminum–titanium alloys (cont'd)
hydrogen equilibrium pressure and concentration in α-phase, 9: 2329(J)
lattice parameter, resistivity, magnetic susceptibility, and other physical properties, 9: 5055
lattice sites in the AlTi phase, effects of Al on occupation, 9: 1539
mechanical properties and microstructure of flash-welded, 9: 965
mechanical properties of, effects of structure and composition on, 9: 201(J)
melting techniques and forging temperatures for preparation of, 9: 1850(R)
metallurgical properties, 9: 3475
microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296
phase studies, bend ductility, tensile properties, hardness, and microstructures of as-rolled and heat-treated welded and unwelded, 9: 3403(R)
preparation by nonconsumable and consumable electrode arc melting, 9: 2293(R)
preparation of homogenous γ, 9: 3850(R)
quench transformation in, nature of, 9: 1844(R)
room-temperature dynamic elastic modulus and its ratio to density, 9: 2728(R)
strength, effects of temperature, 9: 2282
tensile, bend, and hardness properties of as-rolled and heat-treated welded and unwelded, 9: 3499(R)
tensile properties and microstructure, effects of heat treatment on elevated-temperature, 9: 2719(R)
tensile properties at room-temperature, effects of creep tests conditions on, 9: 2275(R)
welding and mechanical properties, effect of alloying elements on, 9: 3854(R)
Aluminum–titanium–vanadium alloys
aging characteristics and tensile, bend, and hardness properties of as-rolled and heat treated welded and unwelded, 9: 3499(R)
electroplating and tensile properties, 9: 3853(R)
fabrication, heat treatment, and effect of section size on mechanical properties, 9: 1534
fabrication by powder metallurgical treatment, 9: 7785
hardness, crystal structure, and phase studies, 9: 3520
hardness of, water quenched from 1000°C, 9: 1842(R)
heat treatment, mechanical properties, microstructure, and phase studies, 9: 7000
melting techniques and forging temperatures for preparation of, 9: 1850(R)
partial isothermal sections of, at 800, 900, 1000, and 1200°, 9: 1843(R)
phase studies, 9: 1844(R)
tensile properties and microstructure, effects of heat treatment on elevated-temperature, 9: 2719(R)
tensile strength, yield strength, and bendability, effects of heat treatment on, 9: 5656(R)
Aluminum–titanium–zirconium alloys
hardness, crystal structure, and phase studies, 9: 3520
impact testing, presintering and sintering and stress-rupture testing of sintered, 9: 3850(R)
Aluminum–tungsten alloys
crystal structure, 9: 2373(J)
Aluminum–zinc alloys
corrosion in 95°C, low-conductivity, aerated, distilled water, 9: 2725
creep, activation energies for, 9: 5961
creep, intercrystalline fracture, and grain structure, 9: 4456
creep of, grain-boundary movement, slip, and fragmentation during, 9: 2321(J)
intercrystalline grains in, growth of, determined by the method of microhardness, 9: 642(J)
Aluminum–zinc alloys (cont'd)
oxidation and corrosion, effects of alloying elements on, 9: 7011(J)
quenching effects of, with reference to elastic properties, 9: 6320(J)
thermodynamic properties, 9: 972(R)
Aluminum–zirconium alloys
as container material for Ti, evaluation, 9: 4780
creep-rupture, 9: 190(R)
creep-rupture at elevated temperatures, 9: 2727(R)
crystal structure and properties of, 9: 2762(J)
electrodeposition, 9: 6291
metallurgical properties, survey, 9: 3822(J)
spectrographic determination of Al in, 9: 6195
Aluminum–zirconium couples
solid state bonding, tensile properties, and intermetallic penetration, 9: 6303(J)
American Electro Metal Corp., Yonkers, N. Y.
progress reports on cemented borides, 9: 150(R), 7326(R)
progress reports on evaluation of high temperature materials, 9: 5654(R)
progress reports on the effect of impurities on properties of carbides, nitrides, and borides, 9: 4992(R)
progress reports on effect of raw material production variables on properties of carbides, nitrides, and borides, 9: 2703(R)
progress reports on high-temperature materials, 9: 4791(R)
progress reports on investigation and evaluation of new high-temperature materials, 9: 3841(R)
progress reports on investigation of intermetallic compounds of Al, 9: 3165(R), 3850
American Lava Corp., Chattanooga
progress reports on ceramic-to-metal seals, 9: 4138(R)
American Meat Inst. Foundation, Chicago
progress reports on utilization of gross fission, 9: 10(R)
Americium
(See also Actinides; Transplutonic elements; Transuranic elements.)
chelation with thenoyltrifluoroacetone, 9: 924(J)
separation and purification of, from the actinides and rare earths by ion exchange, 9: 7985(P)
spectra, term analysis of, 9: 6868
vapor pressure, 9: 3081(J), 5410(J)
Americium(III) fluorides
heats and free energies of sublimation and vapor pressure of, at elevated temperatures, 9: 3800(J)
vapor pressure measurement, 9: 5410(J)
Americium(III) ions
isotopic exchange reactions of, with Am(V), 9: 4112(J)
oxidation to Am^{+6}, 9: 1230(J)
Americium(V) ions
isotopic exchange reactions of, with Am(III) and Am(VI), 9: 4112(J)
Americium(VI) ions
isotopic exchange reactions of, with Am(V), 9: 4112(J)
preparation by oxidation of Am^{+3}, 9: 1230(J)
Americium isotopes Am^{239}
decay schemes and nuclear spectra, 9: 4863
Americium isotopes Am^{241}
alpha cross sections, 9: 4705(R)
alpha spectrum, measurement, 9: 7905(J)
conversion electron spectrum, 9: 4864

Americium isotopes Am^{241} (cont'd)

decay scheme from spectral studies in α decay, 9: 2063(J)

electron spectra, 9: 4705(R), 7906(J)

gamma and x-ray spectra, 9: 2967(J)

internal conversion electron spectrum, 9: 6456(J)

Americium isotopes Am^{242}

electron spectrum and decay scheme, 9: 7906(J)

Americium isotopes Am^{243}

decay schemes and nuclear spectra, 9: 4863

half life, 9: 7272(R)

Ames Lab., Ames, Iowa

progress reports in physics, 9: 1994(R), 4266(R), 5755(R)

Amides

poly-, proton magnetic resonance absorption in linear, 9: 7503(J)

Amine complexes

of cobalt, H_2 high-temperature, high-pressure reduction, design and performance of equipment for, 9: 1181

Amines

(For derivatives see by name of substituent, e.g., Dodecylamine acetate.)

chemical reactions with BF_3 and other boron compounds, kinetics, 9: 6874

reactions with BF_3, 9: 2624(J)

Amino acids

acetylation of, by ethyl thioltrifluoroacetate in aqueous solution, 9: 123

beta radiation effects on aqueous solutions, 9: 6930(J)

of blood serum lipoproteins, chromatographic determinations, 9: 3071

chromatographic determination of, in urine and tissues, 9: 5261

effects of x radiation on, mechanisms, 9: 4403(J)

incorporation by Trichinella larvae, tracer study, 9: 2099(R)

radioinduced erythema inhibition with, 9: 2602(J)

reaction mechanisms of, 9: 6820(R)

spectrophotometric analysis of, in blood serum, 9: 3778

trifluoroacetyl, hydrolysis, 9: 4705(R)

urinary excretion and blood plasma levels in irradiated rats, 9: 7233

Ammonia

alpha-induced decomposition of, variation in source intensity on, 9: 3425(J)

crystalline, Raman spectrum at −82°C, 9: 888(J)

decomposition, effect of x- and α radiation on, 9: 7715(R)

decomposition of, at elevated temperatures, 9: 7296

effects of electrons on, 9: 4705(R)

hyperfine structure of inversion transition of $N^{14}H_3$, 9: 6807

molecular structure, theory, 9: 231(R)

production from Florida leached zone material, cost factors, 9: 7270

Raman spectra of 3-D labeled, at −82°C, 9: 888(J)

reactions with BF_3, 9: 2624(J)

reactions with diborane, 9: 5249

recovery of, from thermal decomposition of $(NH_4)_2SO_4$, 9: 5879

solid γ-irradiated, paramagnetic spectra, 9: 3423(J)

Ammonia (liquid)

cleaning of residual Na from loops with, 9: 4179(R)

decomposition of tetraalkylammonium amides and tetraethylammonium by, 9: 2218(J)

potentiometric titrations in, using a difference indicator electrode system, 9: 1206(J)

reaction with BF_3 and BI_3, 9: 515

Ammonia (liquid) (cont'd)

thermoelectric power of alkali metals in, 9: 1911(J)

Ammonia–boron fluoride systems

preparation, properties, and reaction mechanisms, 9: 515

Ammonia–helium systems

mutual solubility of gases at high temperatures in, 9: 3239(J)

Ammonium aluminum sulfates

conversion of, into alumina, 9: 5881

recovery of Al from, by crystallization, solubility in ammonium sulfate, 9: 5880

Ammonium borohydrides, tetraalkyl-

melting points, preparations, and solubilities in various solvents, 9: 2131

Ammonium bromides

radiation chemistry, 9: 900(J)

titration of, with K and K amide in liquid ammonia using difference indicator electrode system, 9: 1206(J)

Ammonium compounds

polarographic behavior of, in molten ammonium formate, 9: 7292

preparation and properties of hydroxyfluoberyllates, 9: 5899(J)

Ammonium compounds, quaternary

of fluoride and bromide, melting points, preparations, and solubilities in various solvents, 9: 2131

preparation and chemical reactions of alkali metal ammonium and tetraalkylammonium fluoborates, 9: 2679

radiation decomposition of, 9: 102

synthesis and decomposition in liquid ammonia, 9: 2218(J)

Ammonium fluoborates

nuclear resonance spectra, 9: 4641(J)

Ammonium formates

polarographic behavior of inorganic compounds in, 9: 7292

Ammonium hydroxides

production of, by decomposition of $(NH_4)SO_4$, cost factors, 9: 6878

Ammonium iron(II) sulfates

energy absorption and ionization calculations for Co^{60} and betatron irradiation of solutions of, 9: 2201(J)

Ammonium nitrates

explosive decomposition of, causes, 9: 66

production from Florida leached zone material, cost factors, 9: 7270

Ammonium phosphates

x-ray-diffraction analysis data, 9: 1945

Ammonium sulfates

decomposition of, for production of NH_4OH, 9: 6878

pile-neutron irradiation of, carbon compounds from, 9: 4404(J)

solubility of ammonium aluminum sulfates in, 9: 5880

thermal decomposition of, for recovery of NH_3 and SO_2, 9: 5879

Ammonium zirconium fluorides

crystal structure, 9: 2227(J)

Ammunition

characterization of powdered pyrotechnic ingredients, 9: 4778

Amoeba

cell division in, effects of x irradiation on, 9: 2112(J)

radiosensitivity effects, 9: 4911(R)

Amphibians

metamorphosis of axolotls, effects of age, coloring, and sex, 9: 471(J)

Amplifiers

(See also Electron tubes.)

automatic zeroing circuit for d-c, 9: 4226

Amplifiers (cont'd)
circuits with input impedance for, 9: 274
design and performance of linear, for use with scintillation detectors, 9: 3913
design of, for reactor control, 9: 7436(J)
design of, for use with piezoelectric crystal pressure gages, 9: 6374
design of, for use with servomechanisms, 9: 4229
design of d-c, for neutron survey equipment, 9: 3250
design of variable capacitance, 9: 1438(P)
development of non-blocking, 9: 6751(J)
difference, for HRE simulator, circuit for, 9: 371
double-delay line, for use with scintillation spectrometers and preamplifier for fission chambers, design, 9: 4842(R)
fast response, for scintillation detectors, 9: 3941(J)
feedback, criteria for docile behavior of, 9: 5097
magnetic, design, 9: 7070(R)
magnetic, for neutron flux measurement systems, 9: 7454(R)
mixing pre-, circuits for, 9: 281(J)
pulse, circuit changes to improve the linearity of the voltage output, 9: 1027(J)
pulse, circuit diagram for, 9: 4857(J)
pulse, effect of feedback on noise in, 9: 1588
for reactor control, development of, 9: 1308
signal noise and resolution for nuclear counters, 9: 1319(J)
single loop, design, 9: 1582
small current d-c, for photocells and ion chambers, 9: 1951(J)
two-stage distributed, design, 9: 5098(J)
voltage calibration system for, 9: 5406
voltage stabilization in, circuit for, 9: 5561(P)

Amylases
salivary, inhibition by U, 9: 5585(J)

Analgesics
(See also Anesthetics.)
effects of, on survival and mortality of x irradiated mice, 9: 4665
pharmacological effects of, effects of radiation on, in rats, 9: 13

Aniline, N-methyl-N,2,4,6-tetronitro-
(See Tetryl.)

Analysis
(See also appropriate subheadings under specific materials; see also specific methods, e.g., Chromatographic analysis; Isotopic equilibration analysis; Radiometric analysis.)
and control of composition of flowing streams of mixed fluids, 9: 5552(P)
of ion purities in aluminum, methods for, 9: 6313(J)

Anemometers
characteristics of hot wire, for low speeds and elevated air temperatures, 9: 6703
hot-wire, for turbulence measurements, design and performance, 9: 4764

Anesthesia
effects of x irradiation on, in rats, 9: 6826

Anesthetics
(See also Analgesics.)
effects of administration of, on radiosensitivity in rats, 9: 6826
pharmacodynamic properties of the chlorohydrate of chloro-3(dimethyl-amino-3' propyl)-10-phenothiazine, 9: 3045(J)
synthesis of C^{14}-labeled anesthesin, novocain, and cocaine, 9: 7315(J)

Aneth Quadrangle (Utah)
photogeologic map of, 9: 7772(J), 7773(J), 7774(J)

Aniline, N, N-dimethyl-p-phenylazo-
solutions of, radiolysis, 9: 4751(J)

Animal cells
mast cells, morphology of heparin storage and elimination, 9: 1706(J)
morphological effects of exposure to β particles on, in mice, 9: 5219(J)
morphology of, in malpighian tubules, in grasshoppers, 9: 3(R)
radiosensitivity, factors affecting, 9: 3015(J)
somatic, factors affecting radiosensitivity, 9: 821(J)

Animal metabolism
effects of irradiation on steroidogenesis in isolated calf adrenals, 9: 1165(J)
(See also Meteorological instruments.)

Animals
carbohydrate metabolism in, studied by C^{14}, 9: 7664(J)
radiation injuries in, mechanism of development, 9: 7612(J)
unconditioned stimulus in, use of γ radiation to produce, 9: 5851(J)

Anion exchange materials
adsorption of acids by polyvalent forms of, 9: 2212(J)
selectivities of, by osmotic behavior, 9: 3100(J)
titration studies, 9: 872(J)

Anions
beam production and measurement of scattering, apparatus for, 9: 2471
electroreduction of, theory, 9: 856(J)

Ann Arbor
meteorology, 9: 4870

Annealing
(See also appropriate subheadings under specific materials.)
activation temperatures for, of neutron-damaged graphite, 9: 6922
in neutron-irradiated LiF crystals, 9: 6797(J)
techniques and experiments with cold-worked metals, 9: 980(J)

Annie Creek Area (S. Dak.)
occurrence of autunite in, 9: 165(J)

Annie Laurie Prospect (Ariz.)
biogeochemical exploration in, 9: 5003(J)
uranium distribution in Ruby quadrangle, 9: 161

Anoxia
effects of, on radiosensitivity of hematopoietic cells of tadpoles, 9: 1440(J)
tolerance to, effects of total-body x irradiation on, in guinea pigs, 9: 2110

Anthracene
luminescence and absorption spectrum of crystals of, at low temperatures, 9: 7300(J)
response to low-energy protons and x rays, 9: 4962(J)
scintillation response of, 9: 7494(R)
scintillation response of, at low particle energies, 9: 707(J)

Anthracene crystals
preparation, 9: 4948
scintillation response to low-energy protons and helium ions, 9: 7180(J)

Anthranilic acid
uses in volumetric estimation of Th, 9: 2642(J)

Anthranilic acid, 3-hydroxy-
conversion into N^1-methylnicotinamide in rats, tracer study, 9: 124(J)

Anthranilic acid, 5-iodo-
uses in gravimetric estimation of Th and its separation from cerite earths, 9: 2642(J)

Anti-seize compounds
(See Lubricants.)

Antibodies
labeled with I^{131}, preparation and localization in tumors, 9: 3748(R)

Antibodies (cont'd)
radiosensitivity of pertussis-vaccinated mice, 9: 4670(J)

Antimony
absorption of cosmic μ mesons, 9: 721
anion exchange separation, 9: 3109(J)
determination in cathode materials, 9: 1893(R)
deuteron reactions (d,p) at 15 Mev, proton energy spectra from, 9: 4574(J)
μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)
proton stopping cross section, 9: 2026
radiochemical determination, 9: 676
separation and determination of, by electrochemical means, 9: 87(J)
spectrographic determination in Bi, 9: 1475
spectrographic determination of, in ores and rocks, 9: 162
vapor pressure, 9: 1188(J)

Antimony bromides
viscosity and electrical conductivity relationship in solutions of, 9: 1748(J)

Antimony–cesium alloys
crystal structure, 9: 1893(R)

Antimony compounds
polarographic behavior of, in molten ammonium formate, 9: 7292

Antimony deuterides
microwave spectra in shorter mm region, 9: 2986(J)

Antimony fluorides
electrical conductivity, 9: 3415(J)

Antimony–germanium alloys
phase studies, 9: 3184(J)

Antimony hydrides
microwave spectra and molecular structure of SbH_3 and SbD_3, 9: 1134(R)
microwave spectra in shorter mm region, 9: 2986(J)

Antimony ions
energy thresholds for decomposition of, in collision with He, 9: 6785(J)

Antimony isotopes
nuclear couplings and quadrupole moments, 9: 2986(J)

Antimony isotopes Sb^{116}
positron energy and γ intensity from isomers of, 9: 447(J)

Antimony isotopes Sb^{117}
decay schemes, 9: 2056(J)

Antimony isotopes Sb^{121}
nuclear quadrupole coupling and moments, 9: 1134(R)
nuclear quadrupole resonances in Sb_2O_3, $Sb(C_6H_5)_3$, $Sb(C_3H_7O)_3$ and $SbCl_3$, 9: 5472(J)
nuclear quadrupole spectrum of, 9: 6765(J)

Antimony isotopes Sb^{122}
beta spectra and decay scheme, 9: 1127(J)
decay of 3.5-min metastable state, 9: 4322(J)
decay schemes, 9: 4631(J), 7574

Antimony isotopes Sb^{123}
nuclear quadrupole coupling and moments, 9: 1134(R)
nuclear quadrupole resonances in Sb_2O_3, $Sb(C_6H_5)_3$, $Sb(C_3H_7O)_3$ and $SbCl_3$, 9: 5472(J)
nuclear quadrupole spectrum of, 9: 6765(J)
beta–γ angular correlations, vector-tensor interactions, 9: 7580(J)

Antimony isotopes Sb^{124}
beta spectra, 9: 440(J), 3969(J)
decay scheme, 9: 1067(R)
gamma emission, absolute no. of quanta in, 9: 1972(J)
use in measuring vapor pressure of Sb, 9: 1188(J)

Antimony–lead alloys
linear expansion, density, electric resistivity, and thermoelectric properties, 9: 7359(J)

Antimony oxides
heat and free energy of formation, 9: 529(J)

Antimony–potassium alloys
crystal structure, 9: 1893(R)

Antimony–rubidium alloys
crystal structure, 9: 1893(R)

Antimony–silver alloys
diffusion coefficient for, over a temperature range 450 to 900°C, 9: 5348(R)

Antineutrons
annihilation, mechanism, 9: 6434(J)

Antioxidants
high-temperature, for synthetic base oils, evaluation, 9: 4115(R), 4419

Antiprotons
annihilation, mechanism, 9: 6434(J)
annihilation cross section, 9: 6435(J), 6757(J)

Antlerites
occurrence in Delta deposit (Utah), 9: 4998

Apatites
exchange of Ra and Ca in, 9: 847

Arachidonic acid
incorporation of linoleate into, in rats, tracer study, 9: 6629

Archeological specimens
age determinations of, by C^{14} dating, equipment, 9: 3255(J)
age determinations of, by radiocarbon dating, 9: 1286(J), 2347(J)
of wood, radiocarborn dates, 9: 4758(J)

Arco Chemical Plant
manual for the preparation of analytical reagents, 9: 6604
manual on mass and emission spectroscopy, 9: 6896
operation, 9: 6187
SF materials accounting, statistical method, 9: 5420

Arden Area (Nev.)
uranium distribution, 9: 1260(J)

Argentina (Mendoza Province)
occurrence of schroeckingerite in, 9: 958(J)

Argon
absorption coefficient for photoionizing radiation, 9: 5810(J)
adsorption of, by graphite at low temperatures, 9: 4399(J)
adsorption on rutile, 9: 3113(J)
adsorption on TiO_2, 9: 4366
alpha particle ionization in, with added impurities, 9: 780(J)
behavior in vacuum systems, tracer study, 9: 4436(J)
boundary lubrication of steel with, 9: 4979
continuous detection and measurement of low concentrations of O_2 by dew-point method, 9: 2636(J)
drift velocity of electrons in, 9: 2539(R)
effects on oscillations in halogen-quenched G-M counters, 9: 309(J)
energy loss of positive ions single scattered in, 9: 1377(J)
energy required to produce one ion pair, 9: 5702(J)
equation of state, 9: 265(J)
heats of adsorption of, on carbon blacks graphitized at successively higher temperatures, 9: 2677
ion pair formation, 9: 4039(R)
ionic species formed by collision of gaseous ions in, 9: 1378(J)
ionization by α particles and fission fragments, 9: 2831

Argon (cont'd)
isotope abundances in certain minerals, 9: 4234(R)
mass-spectrometric determination in geological age estimation, 9: 5337(J)
photoionization efficiencies and cross sections in, 9: 6747(J)
proton ionization yield in, 9: 5755(R)
purification by hot metals, 9: 2382
purity, apparatus for testing, 9: 3776
range-energy relation for slow α particles in, 9: 4615(J)
scattering cross sections of, for He, Ne, and A ions, 9: 5802(J)
scattering of electrons and positrons, 9: 5798(J)
solidified, compressibilities at low temperature, 9: 2824(J)
stopping of deuterons in, 9: 5803(J)
geological age determination of meteorites with, 9: 5949(J)
variation in isotopic abundance of, extracted from radioactive minerals, 9: 626(J)
virial coefficients, crystal properties, and heat of sublimation at 0°K, 9: 7843(J)
x-ray absorption, 9: 4524(J)

Argon–ethylene systems
viscosity of, at 25°C, 9: 3213

Argon ions
collisions with argon, cross section for, 9: 5802(J)
energy loss in gases of positive single scattered, 9: 1377(J)
ionic species formed in gases by collision with, 9: 1378(J)

Argon isotopes
mass-spectrometric determination of, in age estimations of geological formations, 9: 7760
relative amounts in meteorites, 9: 6340(J)

Argon isotopes A^{36}
radioactivity, 9: 3965(R)

Argon isotopes A^{37}
electron capture, discussion of, 9: 6533(J)
electron capture in, orbital electron excitation associated with, 9: 1682(J)
K capture, 9: 1044(J)
K capture and charge distribution of recoil Cl ions, 9: 6128(J)
L to K capture branching ratio, 9: 6455(J)
neutrino emission, 9: 1067(R)
neutrino emission, observation with magnetic and electric deflection spectrometry, 9: 2078(J)

Argon isotopes A^{39}
mass, determination of best value, 9: 3283(J)

Argon isotopes A^{40}
in atmosphere, calculation of age of earth from, 9: 7763(J)
formation of, from decay of K^{40} in dating of archeological specimens, 9: 3463(J)
neutron activation determination of, to determine age of K minerals, 9: 2713(J)
ratio to K^{40} in meteorites, age determination by, 9: 1915(J)
scattering of 9.5-Mev protons, 9: 1390(J)

Argon isotopes A^{41}
gamma spectra, 9: 7113(J)
mass difference with K^{41}, 9: 7113(J)

Argon–methane systems
electron energy loss distribution in, 9: 5698(J)

Argon–nitrogen systems
filling of ion chambers with, advantages, 9: 3949(J)

Argonne Cancer Research Hospital, Chicago
progress reports, 9: 3748(R), 7253(R)

Argonne National Lab., Lemont, Ill.
manual of special materials analytical laboratory procedures, 9: 4074
meteorology, 9: 340
progress reports, 9: 6868
progress reports of Physics Div., 9: 988(R)
progress reports on radiological physics and biological and medical research, 9: 3(R), 2583(R), 4911(R), 6820(R)
progress reports on reactor engineering, 9: 6946(R)

Argonne Research Reactor
design, 9: 3293(J)
reference material on, 9: 6479

Arikaree Formation (S. Dak.)
geology, 9: 7758

Arizona
gadolinium minerals distribution in, 9: 7335
index map showing location of Painted Desert Area in Coconino and Navajo counties, 9: 2268(J)
mineral association in U deposits, 9: 1829
trace elements reconnaissance in Black Mesa Area in Coconino and Navajo counties, 9: 2709

Arizona (Apache Co.)
exploration of the Defiance Uplift in, 9: 1828
geophysical investigations map of Pinto-Chinle Area in, 9: 6658(J)
trace elements reconnaissance in Chuska Mountains Area in, 9: 2709

Arizona (Coconino Co.)
copper–uranium occurrence in Willaha area in, 9: 6652
geophysical exploration of the Ridenour Mine District in, 9: 7334

Arizona (Gila Co.)
exploration of Lulu Belle Claims in, 9: 5325
uranium distribution in King No. 1 claim in, 9: 7759

Arizona (Pima Co.)
geology of Black Dyke Prospect in, 9: 5324

Arizona (Santa Cruz Co.)
biogeochemical exploration at the Annie Laurie Prospect in, 9: 5003(J)
exploration of Ruby Quandrangle in, 9: 161

Arkansas (Garland Co.)
geophysical exploration of Wilson Prospect and Magnet Cove Area in Garland and Hot Springs counties, 9: 7333

Arkansas. Univ., Fayetteville. Coll. of Arts and Sciences
progress reports on chemical effects of nuclear transformations, 9: 4101(R)

Arkansas. Univ., Fayetteville. Engineering Experiment Station
progress reports on development of a mass spectrometer, 9: 3918(R), 3919(R)
progress reports on development of an instrument for the instantaneous analysis of gas mixtures, 9: 1578(R), 1579(R)

Armour Research Foundation, Illinois Inst. of Tech.
(See Illinois Inst. of Tech., Chicago. Armour Research Foundation.)

Aromatic compounds
(See Hydroaromatic compounds.)

Arsenic
anion exchange of, in HCl solutions, 9: 6935(J)
atomic form factors, calculation and survey, 9: 7407(J)
bremsstrahlung reactions at 320 Mev, interpretation of results, 9: 3654(J)
bremsstrahlung reactions at 320 Mev, nuclide yields from, 9: 3653(J)
radiochemical determination, 9: 876

Arsenic (cont'd)

tissue reactions following injection of, in rats and rabbits, 9: 505(J)

vaporization, 9: 2823(J)

Arsenic compounds

polarographic behavior of, in molten ammonium formate, 9: 7292

Arsenic deuterides

microwave spectra in 1- to 3-mm wave region, 9: 2987(J)

Arsenic hydrides

microwave spectra in 1- to 3-mm wave region, 9: 2987(J)

Arsenic isotopes As^{69}

determination and identification, 9: 3917(J)

Arsenic isotopes As^{70}

beta and γ decay, 9: 6800(J)

gamma-ray spectrum, 9: 3917(J)

Arsenic isotopes As^{71}

disintegration, 9: 1412(J), 3340(J)

Arsenic isotopes As^{74}

radiometric localization of brain tumors following administration of, 9: 5876(J)

Arsenic isotopes As^{75}

energy levels, 9: 7131(J)

nuclear quadrupole coupling and moments, 9: 1134(R)

nuclear quadrupole resonances in $AsCl_3$ and $AsBr_3$, 9: 5473(J)

nuclear quadrupole resonances of, in trihalides and the triphenyl, 9: 2900(J)

Arsenic isotopes As^{76}

beta spectrum, 9: 1994(R)

decay schemes, 9: 4633(J)

gamma emission of, 9: 807(J)

Arsenic isotopes As^{77}

gamma spectra accompanying decay of, 9: 3694(J)

Arsenic oxides

heat and free energy of formation, 9: 529(J)

Arsenic sulfides

colloidal particles of As_2S_3, size determination of, by optical methods, 9: 6423(J)

Arsine

microwave spectra and molecular structure of AsH_3 and AsD_3, 9: 1134(R)

vapor pressure, entropy, heat capacity, and heats of transition, fusion, and vaporization, 9: 4376(J)

Arsonium compounds

use in colorimetric determination of Co in alloy steels, 9: 2162

Asbestos

tissue reactions following injection of, in rats and rabbits, 9: 505(J)

Ascorbic acid

luminescence of, under high-energy γ irradiation before and after 50-kv x irradiation, 9: 1783

tissue distribution of, effects of irradiation on, in rats, 9: 6820(R)

tissue distribution of, effects of whole-body irradiation on, in rats, 9: 4911(R)

Astatine

effects of thyroxine and KSCN on accumulation of, by thyroid gland, 9: 1709(J)

reactions of, with protein, 9: 2099(R)

thyroidal accumulation of, effects of propylthiouracil and thyroxine treatment in rats, tracer study, 9: 3730(R)

Astatine isotopes

alpha decay in, relation to shell model, 9: 1999(J)

Astatine isotopes At^{209}

alpha spectra, 9: 7185

Astatine isotopes At^{211}

cyclotron production of, 9: 5571

decay scheme, Auger effect, and spectra, 9: 7185

effects of radiation from, on functioning of thyroid gland in rats, 9: 5574(J)

pathological effects of, on monkeys and rats, 9: 2551(R), 3730(R)

preparation of mc amounts of, suitable for animal injection, 9: 7063

radiometric determination of, in the presence of I^{127} and I^{131} in excised thyroid tissue, 9: 1477

thyroidal accumulation, effect of thiouracil treatment on, in rats, 9: 4039(R)

toxicity of, in monkeys and rats, 9: 5571

toxicity of, in rats and monkeys and effects of thyroxine treatment on, 9: 7232(R)

uptake by thyroid gland, dietary factors, 9: 2099(R)

Astatine isotopes At^{217}

decay schemes and nuclear spectra, 9: 4863

radioactivity and energy levels, 9: 2500

Astrophysics

acceleration of charged particles to cosmic ray energies by electromagnetic induction in galaxies, 9: 673(J)

cosmic abundances of K, U, and Th and heat balances of the earth, the moon, and Mars, 9: 3065(J)

production of Tc^{99} in stars, 9: 1914(J)

Atascosa Formation (Ariz.)

geology of, 9: 161

Atkinson Creek Quadrangle (Colo.)

geologic map of, for mineral investigations field studies, 9: 1525(J)

Atlanta Mine (Nev.)

exploration and U distribution, 9: 1260(J)

Atlantic Ocean Beach (Fla.)

geophysical exploration of, of Florida, Georgia, North Carolina and Virginia, 9: 3828

Atmosphere

(See also Air; Meteorology; Stack disposal.)

argon(A^{40}) content of, calculation of age of earth from, 9: 7763(J)

beta-ray ionization from ground, 9: 3153

in different parts of the world, corrosive effects on metals and alloys, 9: 3824

formation and relative abundance of HT and HTO in, 9: 126(J)

isotopic content of O_2 and N_2 in, 9: 662(J)

outer, exploration by observation of refracted sound waves from atomic explosions, 9: 7491

radioactive contamination of, and estimation, 9: 7250(R)

radioactivity after atomic explosions, in France, 9: 2536(J)

radioactivity in, natural and artificial, 9: 6526(J)

radiological monitoring, 9: 1045(J)

radiological monitoring of, multichannel telemetering system for, 9: 1966

turbulence study at Brookhaven Lab., 9: 341

Atmosphere exposure chambers

detection of boranes in, 9: 6869

Atmospheres

(See also subheadings under equipment using special atmospheres.)

argon dry box, apparatus for testing, 9: 3776

Atomic clouds

behavior of, meteorological factors affecting, 9: 7492

dating of atomic explosions by composite β-decay curves of, 9: 4828(J)

formed by fission product release from stacks, dosage calculations, 9: 2700

nomographs for calculating radiation hazards, 9: 36(J)

radioactivity measurements over Calcutta, 9: 4827(J)

Atomic energy
(See also Nuclear power.)
industrial applications, bibliographies, 9: 6186
industrial applications, conference on, 9: 6147(J)
peaceful uses of, 9: 7899(J)
peaceful uses, meetings of U.S.S.R. division of biological sciences on, 9: 7609(J)
peaceful uses, meetings of the U.S.S.R. division of chemical sciences on, 9: 7680(J)
peaceful uses, meetings of the U.S.S.R. division of physical-mathematical sciences on, 9: 7829(J)
peaceful uses, meetings of the U.S.S.R. division of technical sciences on, 9: 7604(J)
peaceful uses, U.S.S.R. plenary meeting on, 9: 7605(J)
physical foundations and applications, book, 9: 4036(J)
review of Canadian program on, 9: 4037
summary of major activities in programs of, Jan.-June, 1955, 9: 7223(J)
survey of, 9: 1152(J)
theory and practical applications, 9: 7897(J)
Atomic Energy Commission, Washington, D. C.
semiannual report for July–Dec. 1954, 9: 2537(J)
Atomic explosions
base surge, the mechanism of fall-out due to, 9: 4659
chorioretinal burns produced by flash, 9: 3026(J)
dating of, by composite beta-decay curves of radioactive dusts, 9: 4828(J)
design of an elevated tank to withstand, 9: 2101(J)
direction indicator for, 9: 1437(P)
effects of, on elevated tanks and standpipes, 9: 659
effects of and fallout from, basic discussion of, 9: 6148(J)
effects of radiations from, on eyes, 9: 7624(J)
effects of radiation from, on populations, 9: 5226(J)
fall-out monitoring, 9: 6845
genetical effects of radiation from, 9: 6157(J)
injuries from, on residents of Nagasaki and Hiroshima, summary, 9: 3745(J)
mechanical injuries, radiation injuries, and flash burns from, effects of distance on, among survivors in Hiroshima, 9: 3366(J)
meteorological effects, 9: 1990(J)
nomographs for calculating radiation hazards, 9: 36(J)
pathological effects of γ radiation from, in mice, 9: 6825
radiation hazards from, effects of environment, 9: 2590
radiations from, late pathological effects of, on mice, 9: 21(J)
safety and lethal effects, 9: 469(J)
statistical analysis of the medical effects of, on residents of Hiroshima and Nagasaki, 9: 2535
Atomic masses
calculation of, for nuclei of $35<A<202$, 9: 6386(J)
calculation of, for nuclei with $A<34$, 9: 6385(J)
calculation of, for nuclides of $A>201$, 9: 6384(J)
determination with mass spectrometer having nonhomogeneous magnetic field, 9: 5997(J), 6722(J)
empirical equation for, 9: 2916(J)
mass spectroscopic and transmutation data for, in the Cr to Ge region, comparison, 9: 6910(J)
mass spectroscopic determination of mass differences, 9: 730(J)
microwave determination, 9: 729(J)
of nuclei in isobaric sequences, 9: 5466(J)
Atomic models
equation of state of air by Thomas-Fermi, 9: 3211
Atomic models (cont'd)
statistical, solutions to equations of state based on, 9: 4642
temperature-perturbed Thomas-Fermi equation, solutions to, 9: 2990
Atomic power
(See Nuclear power.)
Atomic structure
electron energy levels for Thomas-Fermi and Thomas-Fermi-Dirac potential, 9: 2989
quantum mechanical approach, 9: 7970(J)
relationship of electronic density and electric potential, 9: 465(J)
tables of two-center Coulomb integrals between 1s, 2s, and 2p orbitals, 9: 4239
Atomic weapons
fall-out from, production, distribution, and biological hazards, 9: 6818(J)
Atoms
approximate analytic solution of the Thomas-Fermi equation for, 9: 2096(J)
behavior of energy lands near points of degeneracy in, 9: 6546(R)
concentration of normal, in positive column of electric discharge, 9: 6360(J)
electronic levels of, adsorbed on surface of a crystal, 9: 1930(J)
energy levels below atomic number 70, 9: 4825(J)
mass difference determination by mass spectroscopy, 9: 730(J)
mass of, and their nuclear energy bonds, review, 9: 744(J)
neutral, exchange reactions between, and fast ions, 9: 7044
one-electron energies for free, 9: 4479(R)
scattering factors for, of 23 elements, 9: 6913(J)
simple analytic wave functions for configurations $(1s)^2(2s)$ and $(1s)^2(2s)^2$ in, from He to C, 9: 4339(J)
statistical potential and electron density distributions for, tables, 9: 69(J)
time varying optical absorption of, method of measuring, 9: 2348(J)
trapped in rigid solvents, 9: 5612(J)
Atropine
biosynthesis of C^{14}-labeled, 9: 2105(J)
Auger electrons
emission from heavy elements, 9: 7185
excitation in chlorine, charge accumulation from, 9: 7866(J)
from gold Au^{199}, L yield, 9: 6538(J)
from lead (Pb^{212}), 9: 6539(J)
from palladium (Pd^{109}), characteristics of, 9: 6110(J)
yields of bismuth L levels, 9: 6514(J)
Aurintricarboxylic acid
pharmacological effects of, on rats, 9: 4911(R)
therapeutic effects against tissue damage from Be, 9: 4362(J)
in therapy of Be poisoning, 9: 3(R)
Austenitic stainless steel
(See Stainless steel (austenitic).)
Austin Area (Nev.)
exploration and U distribution in, 9: 1257
Australia
carbon (C^{13}) abundance in coal and limestone of, 9: 6276(J)
Autopsies
on radioactive cadavers, safety, 9: 44(J)
Autoradiography
(See Radioautography.)
Autunites
synthetic hydrogen, chemical and x-ray diffraction analyses, 9: 7761(J)

Auxins

biosynthesis of, by plants, 9: 3(R)

Aviation personnel

hazards from cosmic radiation for, 9: 34(J)

8-Azaguanine

effects on incorporation of adenine into nucleic acids in mice, 9: 1449(J)

Azine

(See Pyridine.)

Azobenzene, dimethylamino-

effects of radiation on, 9: 3888(R), 3889(R)

Azomethane, hexafluoro-

direct fluorination, 9: 890

B

Baca Formation (N. Mex.)

geology and exploration of, 9: 955(J)

Bacteremia

effects of, on survival of irradiated rats, 9: 2546

induced by total-body irradiation on, in rabbits, 9: 7241(J)

induced by total-body irradiation, in mice, 9: 2553(J)

induced by total-body irradiation, in burros, 9: 1156(R)

induced by total-body x irradiation in rats, 9: 2115(J)

induced in mice, following exposure to x radiation and thermal neutrons, 9: 5836

radioinduced, effects of injected inorganic particulate matter on, in mice, 9: 7625(J)

radioinduced, serological identification of bacterial species associated with, in mice, 9: 5232(J)

Bacteria

(See also by species.)

aerosols containing, effect of particle size on bacterial viability, 9: 4041

associated with stored meat spoilage, identification and radiosensitivity of, 9: 10(R)

carbon dioxide metabolism by Rhodopseudomonas capsulatus, 9: 61(R)

fixation of CO_2 by Rhodopseudomonas capsulatus, 9: 506

germ-free rats, effects of radiation, 9: 2546

of intestinal tract, effects of total-body irradiation on, in rats, 9: 6161(J)

metabolic rate of yeast and lactic acid, studied by C^{14}, 9: 7662(J)

oxygen effect in x-irradiated, role of respiration and cellular metabolism in, 9: 24(J)

radiation effects on survival of Cl. botulinum spores and toxins produced by Cl. botulinum and staphylococci, 9: 474

radiation effects on transforming factors of, 9: 7247(J)

radiosensitivity, effect of free-radical acceptors in food, 9: 5218(J)

radiosensitivity of, effects of food processing conditions on, 9: 1715(J)

radiosensitivity of, effects of redox substances on, 9: 6581(J)

radiosensitivity of, factors affecting, 9: 5843(J)

radiosensitivity of, influence of pretreatments and posttreatments, 9: 3743(J)

radiosensitivity of Clostridium botulinum, 9: 11

radiosensitivity of encapsulated and nonencapsulated pneumococci, 9: 5206(R)

recovery from ionizing radiation, nutritional aspects of, 9: 6831(J)

response of Bacillus megaterium to latent period of infecting virus, thermal, x-ray, and deuteron inactivation, 9: 1153(J)

serological identification of, associated with radioinduced bacteremia, in mice, 9: 5232(J)

Bacteria (cont'd)

size measurement, 9: 4911(R)

spores of, resistance to γ irradiation, 9: 33(J)

Bacteriophages

inactivation of, by β particles from incorporated P^{32}, 9: 3367(J)

latent period of effects of radiation, 9: 1160(J)

properties of, effects of three bacterial hosts on, 9: 1153(J)

radioinduced latent period, 9: 2570(J)

radiosensitivity of, effects of oxygen and hydrogen peroxide, 9: 4350(J)

Balances

analytical, testing and inspection, 9: 4074

autographic, design and operating characteristics, 9: 5944

micro-, design, 9: 4230

thermo-, design and operation, 9: 5920(J)

Bald Mountain Mining District (S. Dak.)

geology, mineralogy, and U distribution, 9: 165(J)

Ball mills

vibratory, for production of fine powders, 9: 4980

Bar H Area (S. Dak.)

geologic map of, 9: 5336(J)

Barium

in biological material, estimation by neutron activation analysis, 9: 6203(J)

chromatographic separation on cellulose powder, 9: 4105(J)

K absorption frequency, 9: 3698(J)

μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)

neutron resonances, 9: 1073(J)

radiochemical determination, 9: 876

separation from Ra by fractional precipitation as the chromate, 9: 7731(J)

solubility in liquid Na, 9: 6872

spectrophotometric determination of milligram quantities, 9: 7290

Barium aluminate–rhenium compacts

electronic properties, 9: 2722(R)

fabrication of cathodes, 9: 976

Barium carbonate–rhenium electrodes

performance, 9: 976

Barium carbonate–rhenium–strontium carbonate compacts

fabrication of cathodes, 9: 976

Barium chlorides

concentration of O^{18} in water of crystallization, 9: 2267(J)

Barium compounds

hydroxyfluoberyllates, preparation and properties, 9: 5900(J)

polarographic behavior of, in molten ammonium formate, 9: 7292

Barium ions

distribution of, between melts and solid phases, 9: 6554(R)

elution behavior of, from sulfonic acid resins, 9: 5298(J)

Barium isotopes

concentration and determination of small amounts of, in water, 9: 5604(J)

fission product, importance in absorption by plants, 9: 5837

Barium isotopes Ba^{130}

decay scheme, 9: 803(J)

Barium isotopes Ba^{133}

decay scheme of Ba^{133}–Cs^{133} chain, 9: 2136(R)

Barium isotopes Ba^{131}

decay scheme revision from coincidence studies of γ rays, 9: 2042(J)

Barium isotopes Ba^{133}
decay scheme, 9: 2956(J)
Barium isotopes Ba^{134}
angular correlation and nuclear spin of states of, 9: 7118(J)
conversion spectra, 9: 1411(J)
lifetime of first excited state, upper limit of, 9: 1072(J)
Barium isotopes Ba^{137}
conversion spectra, 9: 1411(J)
K-auger electrons from, 9: 446(J)
neutron inelastic scattering, 9: 4204(R)
Barium isotopes Ba^{139}
decay, 9: 7112(J)
Barium isotopes Ba^{140}
absolute fission yield of, in thermal neutron fission of U^{235}, 9: 467(J)
Barium nitrates
gamma-induced decomposition, reaction mechanism, 9: 5913
Barium oxide–titanium oxide systems
phase studies, crystal structure, heat treatment, and constitution diagrams, 9: 3142(J)
Barium oxides
solubility in liquid Na, 9: 6872
Barium sulfates
catalytic properties of, in γ ionization of Ag_2SO_4 solutions, 9: 6223(J)
precipitation of Ra with, 9: 1207(J)
Barium titanates
bibliographies, 9: 7820
ceramics, aging in, 9: 4141
dielectric and thermal properties and lattice constants of, containing Sn^{4+} ions, 9: 2705(J)
diffusionless phase transformation and crystal structure, 9: 1861(R)
metallography, microstructure, and electromechanical properties, 9: 4993
slip casting of, 9: 3215
Barley
as a test medium in studies of radiation effectiveness, 9: 3369(J)
Barriers
flow properties of CO_2 through porous glass, 9: 7022
Bartol Research Foundation, Philadelphia
progress reports, 9: 4204(R)
progress reports on elastic scattering, total cross sections, angular distribution, and inelastic cross reactions, 9: 3993(R)
Basal metabolism
(See also Metabolism.)
measurements of, in rats and mice, 9: 6154(R)
Bases
definitions of concepts of, 9: 3056(J)
theory, 9: 3762
Bastnaesites
occurrence in Mountain Pass District (Calif.), 9: 3837(J)
Bats
radiosensitivity of, effects of hibernation and starving, 9: 5215(J)
Battelle Memorial Inst., Columbus, Ohio
progress reports, 9: 5297(R)
progress reports on an investigation of the mechanism by which B increases the hardenability of steel, 9: 3857(R)
progress reports on causes of cracking in high-strength weld metals, 9: 3494(R)
Battelle Memorial Inst., Columbus, Ohio (cont'd)
progress reports on development of a radioactive-dust collector, 9: 1798(R), 1799(R), 1800(R), 1801(R), 1802(R)
progress reports on development of high-strength filler metals for welding steels, 9: 3497(R)
progress reports on effect of elevated temperature on the fatigue strength of sintered Al powder, 9: 3846(R), 3855(R)
progress reports on effect of grain size on mechanical properties of Ti and Ti alloys, 9: 3492(R)
progress reports on extrusion of titanium, 9: 2276(R)
progress reports on mechanical properties of Ti and its alloys, 9: 5344(R)
progress reports on metallurgy of molybdenum, 9: 4788(R), 4796(R), 4797(R), 4798(R), 4799(R), 4800(R), 4805(R), 4806(R), 5953(R)
progress reports on rhenium, 9: 2723(R)
progress reports on $(NH_4)_2CO_3$ leaching of U ores, 9: 4145(R)
progress reports on spot-welded joints in Ti alloys and their behavior in fatigue, 9: 1839(R)
progress reports on spot-welding of Ti alloys, 9: 1849(R), 3491(R), 5340(R)
progress reports on the development of Cr–Fe alloys, 9: 3490(R)
progress reports on the effect of grain size on mechanical properties of Ti and its alloys, 9: 1837(R)
Bauxite
preparation of TiO_2 from, 9: 6300(J)
Bearing materials
corrosive effects of lubricants on, 9: 5934(R)
hot-hardness testing of W–Cr–U and W–Cr–V–Co tool steel and Cr–W die steels, 9: 3860
hot-hardness testing of W–Cr–V and W–Cr–V–Co tool steels and Cr–W and Cr–C die steels in liquid NaK, 9: 3507
rolling and sliding contact testing of ferrous and non-ferrous, in liquid NaK, 9: 3507
rolling and sliding contact testing of various ferrous and nonferrous, 9: 3860
Bearings
effects of grease variables on, at high DN, 9: 4422
erosion by steep pressure waves, 9: 5635
lubrication, 9: 5310
lubrication at high temperatures, 9: 1813, 1814(R), 7320
lubrication phenomena for open, shielded, and anti-friction, 9: 2790(R) 2791(R), 6679(R)
stainless steel, use in water of, after impregnation with Teflon, 9: 6267(J)
wear resistance and calculation of stresses, 9: 2280
Behavior
(See also appropriate subheadings under specific animals.)
effects of cumulative doses of x radiation on learning and retention in monkeys, 9: 2109
effects of total-body exposure to γ radiation on, of rats, 9: 2111
Bellows
(See also Valves.)
for liquid metal valves, testing, 9: 4179(R)
testing for liquid metal systems, 9: 6099(R)
testing in liquid metals, 9: 5657(R), 6699(R)
testing of stainless steel, in 850°F Na, 9: 4175(R)
Bentonites
(See also Montmorillonites.)
alpha radioactivity in, 9: 445(J)
analysis, 9: 621(R)
Benzaldehyde (labeled)
synthesis, 9: 1066(R)

Benzene

luminescence and absorption spectrum of crystals of, at low temperatures, 9: 7300(J)

molecular theory, 9: 4479(R)

pyrolysis, analysis and graphitization of carbons from, 9: 5904(R), 5905(R)

radioinduced chlorination of, 9: 1550(R)

viscosity from 90°C to its critical temperature, 9: 2332

Benzene, bromo-

derivatives of, Br^{79} and Br^{81} nuclear quadrupole resonances in, 9: 2012(J)

Benzene–carbon tetrachloride systems

effects of radiation on, with indicator sensitizer solutions, 9: 2847(R)

Benzene, 1,2,4,5-tetrachloro-

nuclear quadrupole spectrum, 9: 7497(J)

Benzenediacetic acid, diethyl ester

isotope effects in condensation of, 9: 4101(R)

Benzenes

mono- and para-disubstituted, infrared spectra, 9: 6626

monosubstituted, infrared spectra, 9: 6624

Benzoic acid

metabolism of, effects of total-body x irradiation on, in rats, 9: 486(J)

photoinitiated oxidation of, by ferric ions in aqueous solution, 9: 3061

radiation chemistry, 9: 2136(R)

Benzoic acid, p-amino-

synthesis of C^{14}-labeled, 9: 7315(J)

Benzoic acid, 2,4,6-trinitro-

decarboxylation, reaction mechanisms, 9: 5883(J)

Benzoyl peroxide

decomposition of cyclohexane solution of, to form phenyl benzoate, 9: 4205(R)

reaction mechanisms with triphenylmethyl radicals, 9: 2331(R)

Benzyl alcohol

oxidation by aqueous acid chromate, hydrogen isotopic effects on, 9: 6868

BEPO

(British experimental pile operations.)

control face shield of, distribution of γ-rays and neutrons in, 9: 7148

Berkelium

chelation with thenoyltrifluoroacetone, 9: 924(J)

properties of, as predicted by the periodic law of chemical elements, 9: 6909(J)

Berkelium isotopes Bk^{249}

decay, half lives, and neutron capture cross sections, 9: 1489

Beryl reserves (Colo.)

distribution in Quartz Creek Pegmatite District, 9: 4156(J)

Beryllium

abundance in primary cosmic rays, 9: 1299(J)

analytical one-electron wave functions in multi-configurational approximation for, 9: 2086(J)

asymmetry in p-n and p-p scattering from, with 285-Mev polarized protons, 9: 7174(J)

attenuation cross sections for 660-Mev protons, 9: 7172(J)

attenuation of 190-Mev deuterons, 9: 778

backscattering from, bombarded by 1- and 2-Mev electrons, 9: 2041(J)

bremsstrahlung differential cross sections produced in, by 1-Mev electrons, 9: 427(J)

charge equilibrium ratios for H ions from proton bombarded, 9: 2486(J)

chemical analysis, review, 9: 4300(J)

colorimetric determination, 9: 7698(J)

corrosion by Bi–Pb–Sn alloy at elevated temperatures, 9: 6659

Beryllium (cont'd)

detection in tissues by means of $Be^9(\alpha, n\gamma)C^{12}$ reaction, 9: 4390(J)

determination and separation from Al, 9: 5888(J)

differential neutron elastic scattering cross sections at 4.1 Mev, 9: 4597(J)

dust, radiometric detection, equipment, 9: 5076

effects of, as an alloying addition, 9: 982(J)

elastic and inelastic scattering from proton bombardment of, 9: 7107

elastic scattering of high-energy polarized protons by, 9: 4885

elastic scattering of 125-Mev electrons by, 9: 1383(J)

elastic scattering of polarized protons from, 9: 4893(J)

energies of K transitions of π-mesonic x rays from, 9: 1909(J)

exploration for, book, 9: 960(J)

machining of, equipment and safety rules, 9: 6675(J)

μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)

π-mesonic atoms of, x radiation from, 9: 7082(J)

π-mesonic x-ray K lines of, 9: 671(J)

metallurgy of, in nuclear energy, 9: 7376(J)

multiple scattering of slow neutrons by, 9: 5805(J)

neutron absorption and total cross sections at 1.4 Bev, 9: 5486(J)

neutron filters of, investigation, 9: 2099(R)

neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)

neutron production by 340-Mev protons, 9: 778

neutron reactions (n,π^0), 400 Mev cross section, 9: 5742(J)

nucleon total scattering cross sections, 9: 3673(J)

pathological effects of injected, effects of aurintricarboxylic acid, 9: 4362(J)

photon reactions (γ,n), 250 Mev, 9: 6772(J)

photonuclear reactions, 9: 2449(J)

polarization of 425-Mev protons scattered elastically from, 9: 2089(J)

polarization of protons by scattering from, 9: 1110(J)

polarographic analysis of, for Pb, 9: 5273(J)

production and fabrication for reactors, 9: 7155(J)

production of μ meson pairs by 345-Mev bremsstrahlung, 9: 1336(J)

production of negative H ions, by 11.5- to 23-kev protons in, 9: 6789(J)

properties and reactor applications, 9: 6476

proton total cross sections at 208 and 315 Mev, 9: 358(J)

radiometric determination, 9: 2634

radiometric determination of, in air, 9: 5720(R)

reaction with α-particles and deuterons, 9: 5761(J)

reaction with fused NaOH, 9: 1466(R)

scattering cross sections for deuterons at 4.0 to 7.8 Mev and protons at 3.0 to 6.5 Mev, 9: 2944(J)

secondary electrons from, for primary electrons of 20 kev to 1.3 Mev, 9: 5989(J)

separation of micro amounts of, 9: 6820(R)

solubility of, in liquid Ga, Sn, and In, 9: 5954

solution of the Fock equations for, in a two-configurational approximation, 9: 2087(J)

spectrochemical determination of, in Al alloys using rotating disc electrode, 9: 7701(J)

spectrographic determination of, in air dust, 9: 122(J)

spectrographic determination of, in ores and rocks, 9: 182

spectrophotometric determination, 9: 5260

three-quantum annihilation of positrons in, 9: 249(J)

tissue distribution of, in rats, tracer study, 9: 4689(J)

tissue reactions following injection of, in rats and rabbits, 9: 506(J)

Beryllium (cont'd)
toxicity in humans, 9: 6862(J)
toxicology of dust, 9: 1913(J)
volumetric determination in beryls and associated minerals, 9: 2165(J)
x-ray absorption, 9: 4524(J)
Beryllium alloys
properties and reactor applications, 9: 6476
Beryllium–aluminum alloys
alloying effect of Be on properties of, 9: 982(J)
Beryllium–aluminum–iron alloys
crystal structure, 9: 2310(J)
Beryllium–boron systems
structure and properties, 9: 6102(J)
Beryllium carbide–uranium carbide systems
constitutional diagram, preparation, and properties, 9: 4416(J)
Beryllium carbides
hot pressing, 9: 174
properties and reactor applications, 9: 6476
Beryllium chelates
with 2,4-pentanedione, formation constants, enthalpy, and entropy, 9: 3390(J)
Beryllium chlorides
production of, by the Sheer-Korman process, 9: 6597
Beryllium citrate complexes
formation and ion-exchange studies of at various pH's, 9: 2675(J)
Beryllium–cobalt–copper–zinc alloys
mechanical properties, 9: 3509
Beryllium–copper alloys
alloying effect of Be on properties of, 9: 982(J)
corrosion by hydraulic fluids, 9: 2795(R)
effects of radiation on, 9: 4820(J)
heat treatment in a 60-kev horizontal furnace, 9: 1891(J)
phase studies, 9: 2748(J), 4472(J)
Beryllium crystals
reflectivity for slow neutrons, 9: 6027
Beryllium, dimethyl-
reaction with Li Al hydrides to form methyl Be hydride, 9: 1740
Beryllium–gallium alloys
constitution diagrams, 9: 5054
Beryllium hydrides
methyl, preparation and properties, 9: 1740
Beryllium hydroxides
decomposition of, for preparation of BeO, 9: 6647
Beryllium–indium alloys
constitution diagrams, 9: 5054
Beryllium ions
elution behavior of, from sulfonic acid resins, 9: 5298(J)
Beryllium isotopes Be^7
cross section for $B^{10}(p,\alpha)Be^7$ reaction, near 200 kev, 9: 6774(J)
disintegration by slow neutrons, 9: 4578(J)
energy levels from $B^{10}(p,\alpha)$ reaction, 9: 5506(J)
formation of, by interaction of cosmic radiation in N, 9: 3655(J)
gamma spectra, 9: 4333
half life variation of, as function of state, calculation of, 9: 6531(J)
microchemical preparation, 9: 4063(J)
production of, by 0.4- to 3.0-Bev proton bombardment of Al, cross sections for, 9: 6074(J)
yield from the reaction $B^{10}(p,\alpha)Be^7$, 9: 7158(J)
Beryllium isotopes Be^9
alpha decay, angular correlation with Li^9 β particle, 9: 5819(J)
energy, half life, and spin, 9: 3626(J)
energy levels, 9: 1067(R), 3656(J), 4578(J), 4876(J), 6080(J), 7107
energy levels from $Li^7(d,n)$ reaction, 9: 4575(J), 6442(J)
excited states at low energies, 9: 6050(J)
as possible intermediate state in reaction $O^{16} + p \rightarrow p + 2\alpha + Be^8$, $Be^8 \rightarrow 2\alpha$, 9: 6060
Beryllium isotopes Be^9
alpha reactions (α, nγ), use in detecting Be in tissues, 9: 4390(J)
deuteron reactions (d,α) and (d,t), energy levels from, 9: 6080(J)
deuteron reactions (d,d), 9: 1066(R)
deuteron reactions (d,n), 9: 6454(J)
deuteron reactions (d,n), angular distributions, 9: 4875(J)
deuteron reactions (d,n) and (d,p), 9: 3658(J)
deuteron reactions (d,p), 9: 1397(J)
deuteron reactions (d,p) and (d,t), angular distributions of protons and tritons from, 9: 5152(J)
deuteron reactions (d,p) at 0.60 to 1.45 Mev, angular distributions, 9: 4293(J)
deuteron reactions (d,t), angular distribution, 9: 1651(J)
deuteron reactions (d,t) at 0.60 to 1.45 Mev, angular distributions, 9: 4293(J)
elastic scattering angular distribution of fast neutrons, 9: 4596(J)
energy levels, 9: 7107
energy levels in, magnetic analysis of, 9: 6051(J)
gamma radiation from low-energy proton bombardment of, detection and measurement, 9: 5183
gamma reactions (d,γ), spectra, 9: 7121(J)
intermediate coupling shell-model for, and energy levels, and nuclear moments, 9: 7510(J)
neutron elastic scattering and energy levels, 9: 1067(R)
neutron reaction (n,2n), cross section, 9: 2017(J)
nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)
proton capture at 150 to 518 kev, yield of high-energy γ rays from, 9: 4576(J)
thermonuclear reactions of protons with, in stars, 9: 3647(J)
Beryllium isotopes Be^{10}
deuteron reactions, 9: 1353(J)
electromagnetic separation, 9: 1955
energy levels, 9: 1353(J)
formation of, by $Be^9(p,\gamma)B^{10}$ reaction, 9: 5183
levels of, from $Be^9(d,n)Be^{10}$, 9: 6454(J)
Beryllium isotopes Be^{11}
proton reactions (p,α), 9: 6051(J)
Beryllium–magnesium alloys
alloying effect of Be on properties of, 9: 982(J)
Beryllium–nickel alloys
alloying effect of Be on properties of, 9: 982(J)
neutron irradiation effects on precipitation hardening reaction, 9: 5382(R)
Beryllium ores
colorimetric determination of Be in low-grade, 9: 7698(J)
Beryllium oxide compacts
properties, 9: 6647
Beryllium oxide crucibles
preparation and properties of, for molten Tl, 9: 2246
Beryllium oxide powders
sintering of, at 2500 to 3200°F in H, 9: 6647

Beryllium oxide–titanium systems

hardness and microstructure, 9: 2246

Beryllium oxides

densification of, under pressure of 2000 lb per in^2 at 950°C, 9: 5388(J)

preparation by electrolysis of beryl, 9: 528(J)

preparation of, by decomposition of $BeSO_4$ and $Be(OH)_2$, 9: 6647

production from beryl by fluoride extraction, 9: 1787(J)

properties and reactor applications, 9: 6476

properties of, effect of molten Ti on, 9: 2246

reaction of Th with, at high temperatures, 9: 1247

sintering of, in C-A atmosphere, 9: 5388(J)

thermal conductivity, 9: 2793(R)

Beryllium poisoning

epidemiology, clinical character, and treatment, 9: 4359(J)

therapy with aurintricarboxylic acid, 9: 3(R)

Beryllium reserves (Colo.)

occurrence in Crystal Mountain District, 9: 3157(J)

Beryllium sulfates

decomposition of, for preparation of BeO, 9: 6647

Beryllium–tin alloys

constitution diagrams, 9: 5954

Beryls

distribution in Quartz Creek Pegmatite District (Colo.)

ore selector for, 9: 5557(P)

Bessel functions

machine computation of, 9: 1596

Beta decay

(See also subheadings regarding beta emission under specific isotopes.)

angular distribution functions, Fermi interactions, in Sb^{124}, Tm^{170}, 9: 7580(J)

autoionization effects, 9: 6465(J)

calorimetric measurement of absolute no. of γ quanta during, 9: 1972(J)

coincidence techniques in study of, 9: 4526(J)

conference on, 9: 3968

corrections in theoretical study of, due to presence of atomic electrons, 9: 6537(J)

coupling constants of scalar and tensor interactions in, of Bi^{210}, 9: 2508(J)

discontinuities in disintegration energy and their relation to neutron binding energy, 9: 6459(J)

double, in Cd^{116} and Mo^{100}, lower limit of half-life of, 9: 6124(J)

electrons accompanying, studied by β-e^- coincidences, 9: 6368(J)

emission probability of atomic electrons due to, 9: 6532(J)

Fermi interaction in, 9: 2503

general discussion of, 9: 6446(J)

intensity rules for, to rotational states, 9: 2501

internal and external bremsstrahlung associated with S^{35}, 9: 2969(J)

of light nuclei, review, 9: 6806(J)

of lithium Li^8, angular correlation with Be^8 α particles, 9: 5819(J)

matrix elements calculated for first forbidden, 9: 6751(R)

matrix elements for, by spheroidal core nuclear model, 9: 5828(J)

matrix elements for, in forbidden transitions, 9: 7579(J)

of mesons (K), 9: 7474(J)

of mesons (μ), preliminary data on, 9: 7081(J)

molecular excitation in, 9: 2995(J)

ratio of scalar and tensor coupling constants in, of Rb^{87}, Cs^{137}, Tc^{99}, Fe^{59}, 9: 7579(J)

superallowed transitions in N-Z = 3 series, 9: 6037(J)

Beta decay (cont'd)

table of total disintegration energies, 9: 805(J)

theory, correction factor in, 9: 4648(J)

theory, review, 9: 6805(J)

theory, T values for low-lying states, 9: 3965(R)

Beta particles

(See also appropriate subheadings concerning beta emission or beta reactions under specific elements and isotopes.)

absolute disintegration rates by 4π counting, 9: 4527(J)

absorption and scattering in gases, 9: 6820(R)

absorption in thin layers of Ni, Al, and Co, and relation to surface counting for diffusion measurements, 9: 4000(J)

age-diffusion theory for dosage determinations, 9: 400

atmospheric ionization by, from ground, 9: 3153

biological effects on plant growth in various growth stages, 9: 6830(J)

biological effects on skin, 9: 830(J), 836(J), 2565(J)

biological efficiency in producing erythema, 9: 6844(J)

calorimetry, 9: 1972(J)

from carbon and hydrogen isotopes, detection and measurement by isotopic gas analysis, 9: 2180(J)

from carbon (C^{14}) on paper chromatograms, scintillation counter design, 9: 4705(R)

from carbon (C^{14}) or S^{35}, detection and measurement of trace amounts, 9: 6008(J)

chemical effects on aqueous amino acid solutions, 9: 6930(J)

chemical effects on polystyrene, polyethylene and Teflon, 9: 2664(J)

from chlorine (Cl^{36}) detection and measurement, 9: 4529(J)

in coincidence with γ rays, β spectrometer for study, 9: 716(J)

concentration of activity of, in uranium after heat treatment, 9: 6145(J)

contribution of, to geologic age determinations, 9: 953(J)

counting, bremsstrahlung detection by scintillator for, 9: 3950(J)

detection and measurement, performance of proportional detectors for, 9: 5721(R)

detection and measurement of, from C^{14}, design and performance of scintillation counter for, 9: 701

detection and measurement of, in determinations of the basic weight of fibrous materials, 9: 307(J)

detection and measurement of, in paper chromatograms of labeled compounds, 9: 3263(J)

detection and measurement of, performance of a liquid scintillation counter, 9: 2136(R)

detection and measurement of, survey meter design, 9: 3937

detection in air of, sampling chamber for, 9: 5113

diffusion effects in radioactive sources, 9: 2040(J)

dosage determinations of, binominal formula for describing transmission and absorption, 9: 5447(J)

dosimetry of, from internally administered sources, 9: 498(J)

dosimetry of, performance of ionization chamber dose-rate meters for, 9: 5439(J)

energy absorption and ionization calculation for irradiation of ferrous ammonium sulfate solutions with, 9: 2201(J)

favored transitions from N – Z = 3 nuclei, on basis of spin-dependent forces, 9: 6048(J)

fluorescence caused by irradiation with, 9: 7494(R)

genetic effects on plants, 9: 6165(J)

hematological effects of, from Sr^{90} in monkeys, 9: 2114(J)

from incorporated P^{32}, inactivation of bacteriophage by, 9: 3367(J)

induction of cataracts by exposure to, in rabbit and human eyes, 9: 2113(J)

from internally administered P^{32}, effects on survival times of patients with chronic leukemia, 9: 3037(J)

Beta particles (cont'd)
from iodine (I^{131}), effects on thyroid gland of salmon parr, 9: 828(J)
ionization in pure gases by, determination of average energy to produce ion pairs, 9: 3899(J)
ionization of gases by, 9: 2539(R)
late pathological effects of exposure to, on eyes, 9: 4347(J)
low-energy, detection and measurement, 9: 5727(J)
low-energy, liquid scintillation counting, 9: 4911(R)
low level counter for, 9: 6413(J)
measurement of, from thick sources, 9: 4015(J)
morphological effects of exposure to, in cells in mice, 9: 5219(J)
pathological effects of, on developing embryos in rats, 9: 19
phosphorus (P^{32}), effects of intravenously injected, on reticulo-endothelial systems, 9: 1717(J)
phosphorus (P^{32}), effects on germination and growth of oats, fertilizer effects, 9: 6163(J)
from phosphorus^{32}-labeled larvae, effects on developing parasitic wasps, 9: 5225(J)
from phosphorus^{32} plaques, effects on skin of burros, horses, cattle, and sheep, 9: 1156(R)
from potassium (K^{42}), detection and measurement, in body fluids, in the presence of γ radiation from Na^{24}, 9: 1465(J)
quantitative radiographic determination of, in single cells, 9: 1734(J)
radiation hazards from, in laboratory, control, 9: 4049
radiolysis of acetylene by, 9: 4959
in radiotherapy of malignant epibulbar melanoma, 9: 5244(J)
relative biological effectiveness of, in mammalian systems, compared with effects of other radiations, 9: 3007
self-scattering, self-absorption, and backscattering from indium foils, effect of foil thickness on, 9: 7855
specific activity determinations, 9: 3262(J)
superallowed transitions in N-Z = 3 series, 9: 6037(J)
surface measurement of, in surface tissues in vivo, 9: 8(J)
therapeutic effects on tumors, 9: 3(R), 2547(R)
therapeutic uses of, and dosimetry using x ray film, 9: 7253(R)
from thick solids, absolute assay of, 9: 5444(J)
from thorium and U ores and K salts, measurement of ionization intensity of, 9: 5814
thyroid deficiency resulting from exposure to, from I^{131}, 9: 485(J)
from tritium, detection and measurement, 9: 4852(J)
from tritium, detection and measurement of, in body fluids and aqueous solutions, 9: 5111
from tritium, detection and measurement of, performance of ionization chamber for, 9: 4511
from tritium, dosage determinations and biological effects in rats and man, 9: 12
x-ray excitation by, 9: 2950

Beta sources
(See also Electron sources.)
catalog of, 9: 246(J)
consisting of rubber beads containing homogeneously distributed Sr^{90}/Y^{90}, dosage determinations, 9: 6587(J)
design and fabrication of Y^{90}-fused clay spheres, 9: 7060
design of millicurie, of very limited area, 9: 292
gold (Au^{199} and Au^{198}), 9: 1550(R)
high radiation level, development, 9: 2099(R)
measurement of β activity from thick, 9: 4015(J)
preparation and tissue distribution of colloids of Au^{198}, P^{32}, Y^{90} in animals, 9: 1459

Beta sources (cont'd)
preparation by electroplating Tl^{204} on Cu, 9: 1289(J)
preparation of a mc point source, 9: 7573(J)
preparation of a primary standard of tritium water, 9: 1697
preparation of Ag^{111}, from neutron-bombarded Pd by isotopic exchange, 9: 7441
preparation of standard T source, 9: 6868
radiography using x radiation produced by, 9: 4679
strontium (Sr^{90}), design, 9: 6590(J)
strontium (Sr^{90}), for administration of skin doses, design, 9: 836(J)
tabulation by energy and half life, 9: 5532(J)
yttrium (Y^{90}), design of, for medical use, 9: 7253(R)
yttrium (Y^{90}), preparation and use in papillomatosis of urinary bladder, 9: 5243(J)

Beta spectra
of carbon (C^{14}) and S^{35}, equipment and techniques for measuring, 9: 437(J)
first forbidden transitions, calculations, 9: 2504(J)
probabilities of forbidden transitions, 9: 3699(J)
shapes of allowed and first-forbidden, graphs for determination of, 9: 6518(J)
theory of many- and single-particle matrix elements, 9: 3700(J)

Beta spectrometers
aberrations and resolving power for double-focusing, 9: 1619(J)
backscattering of electrons, 9: 684(J)
calibration, 9: 1121
calibration, source preparation, and film calibration, 9: 4864
calibration and study of Tl^{204} β spectrum, 9: 5117
calorimetric, for absolute γ quanta measurements, 9: 1972(J)
coincidence, intermediate image focusing in, 9: 5730(J)
coincidence techniques in the study of β decay, 9: 4526(J)
corrections for resolving power, 9: 2080(J)
design and performance, 9: 4247
design and performance of ring-focused magnetic, 9: 4333
design and testing of, with magnetic prisms and one magnetic lens, 9: 451(J)
design of, for studying β-γ rays in coincidence, 9: 718(J)
design of long-lens, 9: 1610(J)
design of 100-amp d-c servostabilizer for, 9: 1584(J)
design of Slätis-Siegbahn, 9: 1615(J)
design of variable field survey, 9: 293
electron-optical parameters of, with two focused electron beams, 9: 5725(J)
high-luminosity sector-type, design, 9: 1969(J)
intermediate-image-focusing, adaptation of, to γ pair spectroscopy, 9: 311(J)
magnetic field measurement by nuclear resonance, 9: 1327(J)
modification of double-retarding-field, 9: 2136(R)
neutrino recoil, design, 9: 1044(J)
performance, 9: 1133
preparation and properties of thin polyvinylchloride-acetate copolymer films for 4π counting in, 9: 1613(J)
properties of 180°, 9: 6751(R)
six-gap, design, 9: 4252(J)
theory of Kofoed-Hansen, 9: 4500(J)
trajectory of charged particles in the axial-symmetrical field of, calculation, 9: 5118
vacuum forechamber of, and sample insertion into magnetic lens, 9: 6726(J)

Beta spectroscopy
book, 9: 4902(J)
identification of unknown emitters by graphical absorption analysis, 9: 2065(J)
techniques and applications in nuclear measurements, 9: 4333
Betatrons
Allis Chalmers, calibration of, 9: 6090(J)
beam focusing, 9: 6588(J)
bremsstrahlung spectrum from beams of, depth distribution of ionization from, 9: 6407(J)
energy of, determination by activity ratios, 9: 3990(J)
electrons and x radiation from, effects on eyes of rabbits, 9: 6839(J)
orbit stability of, experimental study, 9: 1370(J)
physical aspects and therapeutic applications of, 9: 1724(J)
radiation hazards from, protection against, handbook, 9: 4924(J)
targets for Univ. of Illinois, liquid H, D, and He, 9: 2469(J)
therapeutic use, integral dose measurements, 9: 2878(J)
Bevatron
injector, radiofrequency system, and magnet, development, 9: 3664(R)
ion source, design and performance, 9: 5510
magnetic fields, testing, 9: 3663
operation and development, 9: 5509
operation and improvements, 9: 7946(J)
power supply installation, 9: 5167
pulse-timing equipment design for magnet, 9: 6379
r-f fluctuations, effect on phase oscillations, 9: 7167
r-f measurement system design, 9: 6378
Bianthrone
thermochromism in LCAO MO study of, 9: 2144(J)
Bibliographies
on air pollution, 9: 7(J)
on atomic power and related topics (Canadian), 9: 3003(J)
on properties of deuterium compounds, 9: 7706
on utilization of radioactive and stable isotopes, 9: 7062(J)
Big Boulder Prospect (Colo.)
geophysical exploration and geology, 9: 3157(J)
Big Casino Claim (Colo.)
uranium distribution, 9: 1513
Big Creek Area (Alaska)
monazite occurrence in, 9: 1523(J)
Big Indian District (Utah)
geology and U distribution, 9: 5049(J)
Big Indian Wash Area (Utah)
mineralogy, 9: 1829
Binding energy
calculation of, for nuclei of $33<A<202$, 9: 6386(J)
calculation of, for nuclides of $A>201$, 9: 6384(J)
calculation of, for nuclei with $A<34$, 9: 6385(J)
of light hyperfragments, 9: 7518(J)
of neutrons, determined from (d,p) Q values, 9: 737(J)
nuclear, data from mass spectrographic analyses, 9: 5144(J)
relation to diffuseness of nuclear boundary, 9: 7513(J)
of tritons, equivalent two-body method for, 9: 4336(J)
Biochemistry
radiation effects in, review in Annual Review of Nuclear Science, 9: 3733(J)
radioactive isotopes used in, review of, 9: 7655(J)
Biological materials
activation determination of trace amounts of Ba and Sr in, 9: 6203(J)
containing Ru, sample preparation for analysis, 9: 3777
grinding and particle size measurements, 9: 3720(R)
Biological models
of multi-compartment systems, isotopic tracers as indicators, 9: 4[illegible]
Biological phantoms
(See Phantoms.)
Biological systems
evolution of, by chemical synthesis, 9: 7224
radiation effects, 9: 7229, 7230, 7622(J)
radiation effects, mathematical analysis, 9: 7610
Biology
applications of radioisotopes to, 9: 7608(J)
Biology conferences
on cancer research, 9: 7226(J)
on genetic recombination, 9: 6153(J)
on medical and physiological applications of radioisotopes, 9: 3718(J)
on radioinduced cataracts, 9: 3722, 3723, 3724, 3725
on the thyroid, 9: 3004
Biometry
multiple sampling applied to estimates of members of a population having a particular attribute, 9: 2103
a statistical analysis of congenital malformations from exposure to x radiation, 9: 3025(J)
Biphenyl
determination in presence of other polyphenyls by a water solubility meth[illegible] 9: 4723
distillation and heat transfer, 9: 608
pyrolytic reactions of, under high heat flux conditions, 9: 608
reactions with terphenyl, 9: 4701
Biphenyl–terphenyl systems
chemical interactions, 9: 4701
Bipyridines
complexes of, with Ru, spectral studies, 9: 5613(J)
Birch Creek District (Idaho)
exploration for U and Th deposits in, 9: 1520(J)
Birefringence
calibration of streaming birefringence apparatus, 9: 2164
Birmingham, Univ., England
progress reports on titanium research, 9: 2738(R)
Birthday Claims (Calif.)
mineralogy, 9: 3837(J)
Bismuth
atomic heat of, between 1 and 4°K, 9: 990(J)
colorimetric determination, 9: 543(J)
complexometric titration, 9: 1201(J)
cross sections for neutron transmission and multiplication, 9: 3646(J)
differential neutron elastic scattering cross sections at 4.1 Mev, 9: 4597(J)
diffusion of, in liquid Bi-Pb alloys, 9: 5669(J)
effect of magnetic fields on resistivity, 9: 3577
elastic scattering of polarized protons from, 9: 4893(J)
extraction by mesityl oxide, 9: 2674(J)
fission by deuterons, 9: 5116
fission by π^- mesons, and star formation, 9: 6436(J)

Bismuth (cont'd)
fluorescence, Auger, and Coster-Kronig yields of, for L levels, 9: 6414(J)
gamma rays excited by scattered neutrons, 9: 3993(R)
identification of, in rocks with nuclear emulsion plates, 9: 5339(J)
ion exchange of, from Po at room temperature, 9: 593(J)
low-temperature specific heat, 9: 188(R)
meson (π^-) capture by, fission and star formation yield, 9: 7473(J)
multiple scattering of slow neutrons by, 9: 5805(J)
neutron absorption and total cross sections at 1.4 Bev, 9: 5486(J)
neutron differential scattering cross sections at 3.7 Mev, 9: 4204(R)
neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 3443(J)
neutron total cross section, 9: 297
neutron total cross section from 0.1 to 10.0 ev, measurement, 9: 2099(R)
properties and reactor applications, 9: 6476
proton- and π^--meson-induced fission in, study of mechanism and results, 9: 7935(J)
proton fission at 480 Mev, cross sections and distribution curve, 9: 7936(J)
proton fission cross sections at 450 Mev, 9: 7552(J)
proton fission of, from 75 to 450 Mev, 9: 7553(J)
proton reactions at 460 Mev, fission and star formation, 9: 7538(J)
proton reactions at 660 Mev, fission and spallation products, 9: 7537(J)
proton stopping cross section, 9: 3026
radiometric determination, 9: 2634
separation and determination of, by electrochemical means, 9: 87(J)
spallation by 480- and 660-Mev protons, cross sections, 9: 7939(J)
spallation by 480-Mev protons, cross section and yield, 9: 7938(J)
spectrographic determination of, in ores and rocks, 9: 162
spectrographic determination of Cd, Cr, Fe, Mn, Ni, Ag, Sn, Sb, Pb, and Zn in, 9: 1475
spectrophotometric determination with Na diethyldithiocarbamate in presence of foreign metals and alloys, 9: 2172(J)
transition probabilities, dipole and quadrupole, 9: 7917(J)

Bismuth (liquid)
diffusion in molten Bi–Pb alloys, 9: 179
diffusion in Pb (liquid), 9: 179
solubility and diffusion of Xe(g) in, theory, 9: 6177

Bismuth alloys
phase studies of, at very low temperatures, 9: 2320(J)

Bismuth compounds
polarographic behavior of, in molten ammonium formate, 9: 7292

Bismuth films
crystallite activity, effects of exposure to electron beam on, 9: 3175(R)
electric resistance, effects of temperature, pressure, humidity and aging on, 9: 3175(R)

Bismuth–germanium alloys
phase studies, 9: 3184(J)

Bismuth ions
energy thresholds for decomposition of, in collision with He, 9: 6785(J)

Bismuth(III) ions
absorption of, from hydrochloric acid, nitric acid, and ammonium nitrate solutions with a strong base quaternary amine anion-exchange resin, 9: 1226(J)

Bismuth isotopes
alpha decay in, relation to shell model, 9: 1999(J)

Bismuth isotopes Bi^{203}
gamma spectra, 9: 7272(R)

Bismuth isotopes Bi^{206}
gamma spectra, 9: 7272(R)

Bismuth isotopes Bi^{207}
decay, 9: 7196(J)
decay scheme, 9: 1067(R), 4635(J), 7272(R)
gamma spectra, 9: 4333

Bismuth isotopes Bi^{209}
deuteron reactions (d,p), proton angular distributions from, 9: 762(J)
fission cross sections for 120- to 380-Mev neutrons, 9: 5156(J), 5778(J)
proton reactions (p,n), cross sections, 9: 7386

Bismuth isotopes Bi^{210}
beta spectra, 9: 1676(J)
beta spectra, coupling constants of scalar and tensor interactions in, 9: 2508(J)
electron emission of, scattering angle in nuclear emulsions, 9: 715(J)
forbidden β transition of, internal bremsstrahlung and atomic ionization accompanying, 9: 6535(J)
L and M x rays following autoionization, measurement of, 9: 6534(J)
lifetime of 46.5-kev state following B decay of Pb^{210}, 9: 6799(J)
nuclear magnetic moment, 9: 988(R)

Bismuth isotopes Bi^{211}
decay schemes and conversion electrons, 9: 383(J)
radiation of great track length from, 9: 808(J)

Bismuth isotopes Bi^{212}
alpha decay scheme, 9: 7576(J)
angular correlations (α-γ), spin assignments, and internal conversion coefficients, 9: 2974(J)
Auger transitions in, 9: 3331(J)

Bismuth isotopes Bi^{213}
decay schemes and nuclear spectra, 9: 4863
radioactivity, 9: 2500

Bismuth isotopes Bi^{214}
beta spectra, 9: 4629(J)
decay spectrum, 9: 2976(J)

Bismuth–lead alloys
segregation of impurity Po to grain boundaries, 9: 3186(J)

Bismuth–lead alloys (liquid)
diffusion of Bi in, 9: 5669(J)
diffusion of Pb and Bi in, tracer techniques, 9: 179

Bismuth–lead–tin alloys (liquid)
corrosive effects on metals at high temperatures, 9: 6659

Bismuth–manganese alloys
large magnetic Kerr rotation in, 9: 1540(J)

Bismuth oxides
heat and free energy of formation, 9: 529(J)

Bismuth–potassium alloys
microhardness and surface tension, 9: 3527(J)

Bismuth–sodium alloys
microhardness and surface tension, 9: 3527(J)

Bismuth–sodium alloys (liquid)
flammability of, at high temperatures, 9: 5590

Bismuth–tin alloys
changes in properties of, due to crystallization, 9: 4199(J)

Bismuth–uranium alloys (liquid)
corrosive effects on stainless steel, 9: 3285

$\Delta^{9,9'}$-Bixanthene
thermochromism in, LCAO MO study of, 9: 2144(J)

Black Creek Valley Area (Ariz.)

exploration and geology, 9: 1828

Black Dyke Prospect (Ariz.)

exploration and geology, 9: 5324

Black Hills (S. Dak.)

exploration, 9: 1514(R)

Black Mesa Area (Ariz.)

geophysical exploration, 9: 2709

Black shales

petrology of U-bearing, 9: 1826(R)

Black shales (Ariz).

occurrence and analysis of, in Arizona and N. Mexico, 9: 2709

Black shales (Tenn.)

analysis for U, 9: 4997(R)

Blackbird District (Idaho)

exploration for U and Th deposits in, 9: 1520(J)

Bladder

cancer of, radiotherapy by means of balloons filled with Co^{60} solutions, 9: 7651(J)

ion transfer through mucosa of normal and artificially constructed, tracer study, 9: 1732(J)

tumors of, radiotherapy with Co^{60}, 9: 6851(J)

Blanding District (Utah)

geology, 9: 2262(R)

Blast effects

synergestic effects of, with effects of total-body irradiation on mice, 9: 3744(J)

Blood

distribution of Po^{210} in, 9: 1708(J)

effects of x radiation on phagocytosis and bactericidal power, 9: 2577(J), 2578(J)

flow in liver, effects of diet, adrenaline, and chronic lymphatic leukemia on, tracer study, 9: 2609

fractions of, affinity of Po for, following injection to rats, tracer study, 9: 509(J)

proteins, protective effects of, against radiation injuries in mice, 9: 2598(J)

radiation dose to, during radioiodine therapy, methods for calculating, 9: 1173(J)

sugar levels in, effects of whole-body irradiation on, in rats, 9: 7611

Blood circulation

disturbances of, following burns, in dogs, 9: 5210

effects of total-body irradiation on, in hamsters, 9: 489(J)

in rat liver, tracer study, 9: 5246

Blood diseases

(See also Leukemia; Septicemia.)

hemoglobinemia induced by thermal radiation, in pigs, 9: 5841

radiotherapy, review, 9: 5587

treatment of erythremia and leucosis with P^{32}, 9: 7645(J)

Blood formation

(See also Bone marrow; Hematopoietic system.)

radiation effects, 9: 7621(J)

Blood picture

acute post-burn erythrocyte deficiency, 9: 4913

changes in, as an indication of recovery from radiation injuries, in mice, 9: 7626(J)

changes in, during x-ray therapy, 9: 3038(J)

effects of exposure to x radiation on, 9: 6571(J)

effects of injected spleen homogenates on leukocyte count in irradiated mice, 9: 38

Blood picture (cont'd)

effects of parabiosis on, in x irradiated rats, 9: 4351(J)

effects of radiation on, modifications produced by hypophysectomy, in rats, 9: 7641(J)

effects of shielding on radioinduced anemia and changes in platelet count, 9: 2119(J)

effects of single dose of 135 to 285 r on, in man, 9: 3012(J)

of normal human population, statistical analysis, 9: 2547(R)

radiosensitivity, 9: 5221(J)

Blood plasma

amino acid content of, effects of starvation and whole-body irradiation on, in rats, 9: 6154(R)

amino acid levels in, effects of radiation on, in developing chick embryo, 9: 6820(R)

changes in electrophoretic patterns in, following intravenous injection of Au^{198} to dogs, 9: 829(J)

levels of desoxyribonucleases in, effects of radiation on, in rats, 9: 2579(J)

lipid levels in, effects of radiation on, in rabbits, 9: 25(J)

protein fractions of, protective effects of against radiation injuries in mice, 9: 3(R)

prothrombin levels in, effects of blood platelets on, in normal and irradiated dogs, 9: 3363

Blood plasma substitutes

tissue distribution of polyvinypyrrolidone in normal and irradiated rabbits, 9: 5838

Blood platelets

effects of, on prothrombin levels in plasma in normal and irradiated dogs, 9: 3363

life span of, in rabbits, tracer study, 9: 7670(J)

morphology of, as observed under the electron microscope, 9: 6151(J), 6152(J)

origin and life span of, tracer study, 9: 4695(J)

production, dynamics of, in normal and irradiated dogs, 9: 4930(J)

Blood pressure

effect of dietary Na on hypertension in humans, 9: 472(J)

effects of, on radiosensitivity, in chicks, 9: 7627(J)

Blood serum

amino acid composition, 9: 3778

amino acids of, chromatographic determination, 9: 3071

chromatographic fractionation of iodinated components, 9: 1460

concentration of protein-bound iodine in, effects of injected thyrotropin, 9: 5578(J)

concentration of Na and K in, effects of total-body irradiation on, in hamsters, 9: 489(J)

lipoprotein concentrations in, effects of radiation on, in rabbits, dogs, rats, and mice, 9: 3009

magnesium content of, effects of irradiation, 9: 5223(J)

protective effects of, against radiation injuries in mice, 9: 3(R)

Blood vessels

(See also Capillaries.)

human aorta, changes with age, 9: 4040(J)

Blood volume

determination of, after injection of Cr^{51}-labeled red cells, 9: 3730(R)

measurement, using Cr^{51}-labeled red cells, 9: 6864(J)

measurement of, by external counting following administration of radioxenon, 9: 4039(R)

Bluff Quadrangle (Utah)

photogeologic map of, 9: 5035(J), 5036(J), 5041(J), 5042(J), 6970(J), 6972(J), 6988(J)

Body fluids

ascitic fluid, changes in electrophoretic patterns in, following intravenous injection of Au^{198} to dogs, 9: 829(J)

Body fluids (cont'd)
compartments of, effects of x radiation on, in human subjects, 9: 3031(J)
radiometric determination of tritium in, 9: 5111
simultaneous determination of exchangeable body Na and K in, tracer study, 9: 1465(J)

Boehmites
(See also Bauxite.)
use of, for protection of Al against corrosion, 9: 6264(J)

Boerlin Ranch Area (Nev.)
exploration and geology, 9: 1516(J)

Boilers
corrosion and welding in stainless steel boilers, 9: 6947
cracking in stainless steel auxiliary, for minesweepers, 9: 3168
design and fabrication of Bethelhem hot-water heater and stainless steel cyclotherm, for minesweepers, 9: 3168
development of 3-Mw, for SIR, 9: 6999(R)
effect of pressure on heat transfer coefficient in, 9: 1242(J), 5312(J)
leak testing of Si bronze cyclotherm-type auxiliary, for nonmagnetic minesweepers, 9: 3169
performance of Clayton type, 9: 6948
scale formation in, process for combating, 9: 6648(J)
semi-industrial high pressure, application of radioisotopes to the study of the purity of vapor used in, 9: 6256(J)
steam generators, testing, 9: 4179(R)
stress-corrosion in nonmagnetic auxiliary mine-sweeper, 9: 5947
stress-corrosion of, made of stainless steel, 9: 3145
stress-corrosion of Si bronze and stainless steel, for minesweepers, 9: 3168
stress-corrosion testing in $HgNO_3$ solutions of Si bronze cyclotherm-type auxiliary, for nonmagnetic minesweepers, 9: 3169
temperature distribution in pipes of, at high temperatures, 9: 7745(J)

Boiling
correlation of maximum heat flux during transition, 9: 7024
density transients in volume heated boiling systems, 9: 936(R)
film and bubble formation during, role in heat transfer, 9: 4129
heat transfer, wetting effects on, 9: 6246(R)
heat transfer during, 9: 1238(J), 7324(J)
heat transfer in liquids by, 9: 1811(J)
heat transfer to boiling water forced through a uniformly heated tube, 9: 1804
heat transfer to liquid undergoing, from heating surface by free convection, 9: 1810(J)
heat transmission at, of various one-component liquids at free convection, 9: 1809(J)
in inclined tubes, velocity effect on heat-transfer coefficient, 9: 5940(J)
mechanism of, in power reactors, 9: 7532(J)
photographic study, 9: 6253(J)
power density and effects of voids in channels, 9: 6946(R)
in water, effect of material and material surface treatment on, 9: 7323(J)
of water in vertical tubes, maximum heat flux during, 9: 4434(J)

Boiling Experimental Reactor
design, 9: 3293(J)

Boiling reactors
(See Heterogeneous boiling reactors; Homogeneous boiling reactors.)

Bonanza Creek (Alaska)
exploration, 9: 628(J)

Bonding
(See also Bonds; Brazing; Diffusion; Soldering; Welding.)
eddy current thickness measurement of, 9: 167(R)
equipment for, 9: 4114(R)
in metals, testing, 9: 5363(J)
nondestructive inspection of adhesive, for sheet metal, 9: 167(R)
nondestructive testing of metal-to-metal, 9: 3523
ultrasonic inspection of, of sheet metal, 9: 1263(R)

Bonds
coordinate, kinetics of formation, 9: 2624(J)
lengths of, correlation with stretching frequencies in C-O and C-N systems, 9: 6609
tables of energies for estimating standard heats of formation, 9: 2785

Bone marrow
(See also Hematopoietic System.)
cells of, uptake of sulfate by, tracer study, 9: 4695(J)
depression of Fe^{59} uptake by erythrocytes in, as a test of degree of radiation damage in mammals, 9: 3007
effects of homogenates of, on radiation injuries in mice, 9: 3370
factor in, responsible for hematopoietic recovery following systemic irradiation in mice, 9: 2596(J)
homogenates, effects of injections on success of skin grafting in mice, 9: 2560(J)
homologous, therapeutic effect on animal organisms exposed to ionizing radiation, 9: 7637(J)
injected rat, administered with and without cortisone, effects on recovery of lethally irradiated mice, 9: 4051
injected suspensions of, biochemical effects in rats, tracer study, 9: 1176
injections, effects on inhibition of tumors in irradiated mice, 9: 2597(J)
protective effects of injected, against radiation injuries, 9: 18
radiation protection by grafted, in adult mice, 9: 841(J)
radiosensitivity, 9: 5220(J)
therapeutic effects on radiation injuries, 9: 837(J)

Bone tumors
(See also Bone diseases.)
death rates from, geographic differences, 9: 4911(R)
following administration of Sr^{90} in mice, 9: 2547(R)
geographic distribution, 9: 3(R)
treatment of multiple myeloma with I^{131}, 9: 6850(J)

Bones
(See also Skeleton.)
determination of Sr^{90} in, following dietary administration, 9: 846
developing, effects of irradiation on, 9: 6828(J)
growth, effects of radioinduced thyroid deficiency on, in mice, 9: 485(J)
radioautographic analysis of, preparation of undecalcified samples, 9: 2547(R)
radioautographic analysis of, sample preparation, 9: 5721(R)

Bonniebell Claims (Utah)
mineralogy, 9: 1829

Borax
(See also Sodium tetraborates.)
toxicology of, for laboratory animals and man, 9: 844

Borazole
counting properties of proportional counter filled with, for detection of thermal neutrons, 9: 2417
synthesis and physical properties, 9: 7672

Boric acid
adsorption of, by polyvalent forms of anion-exchange resins, 9: 2212(J)
calorimetric, conductometric, polarimetric, polarographic, and potentiometric determination of, 9: 4378
chemical determination of, in tissues, 9: 53
colorimetric determination of, with carmine, 9: 3069

Boric acid (cont'd)
determination of, in aqueous solutions by chelation, 9: 4379
ion exchange of, from D_2O, 9: 3097
preparation and chemical properties of $B_2(OH)_4$, 9: 4972
thermodynamic properties, 9: 1742
toxicology of, for laboratory animals and man, 9: 844
ultraviolet-absorption determination, 9: 53

Boric acid–water-d_2 systems
separation of boric acid from, by ion exchange, 9: 3097

Boride crucibles
preparation and properties of Ti, Zr, and Cr, for molten Ti, 9: 2248

Borides
(See also specific borides.)
metal, quantum theoretical study of covalent B-B bonds in crystals of, 9: 4068(J)
physical properties, 9: 7326(R)
physical properties of cemented, 9: 150(R)
preparation and x-ray-diffraction analysis of metallic, 9: 3380
preparation by vacuum technique, 9: 1821(J)
reactions with C and N_2, equilibria studies, 9: 5677(J)

Borine, dichlorophenoxy-
preparation and chemical properties, 9: 4712(J)

Borine, trimethoxy-
(See Methyl borate.)

Borines
infrared spectra, 9: 7259
mass spectra and thermal decomposition of dimethylphosphinoborine trimer, 9: 3054
preparation, physical properties, and reactions with Li and hydrocarbons, 9: 7266(R)

Borines, aryl-
chemical reactions of triphenyl borane, 9: 7260

Borines, phosphino-
synthesis and chemical properties, 9: 4697

Borneols
metabolism of, effects of irradiation on, in rats, 9: 4665
metabolism of, effects of whole-body irradiation on, in rats and mice, 9: 6154(R)

Borohydride ions
nuclear magnetic resonance spectra and structure, 9: 918(J)

Borohydrides
(See also specific borohydrides.)
entropy of ionic, 9: 6599
preparation and chemical reaction of organic, 9: 4062(R)

Boron
abundance in primary cosmic rays, 9: 1299(J)
alpha reactions (α,n) and (α,p), 9: 5799(J)
angular distribution of γ radiation from proton bombardment, 9: 1396(J)
bibliographies, 9: 4063, 6180
calorimetric, conductometric, polarimetric, polarographic, and potentiometric determination of, 9: 4378
chemical determination of, in animal tissues, 9: 53
colorimetric determination of, evaluation of derivatives of anthrarufin, chrysazin, and quinizarin as reagents for, 9: 4734(J)
colorimetric determination of, in U and U solutions, 9: 2163
determination of, in Mg alloys, 9: 3480
effects of injected, on blood circulation, and toxic effects on mice, 9: 4039(R)
effects on mechanical properties of Mg alloys, 9: 3480

Boron (cont'd)
electric properties of crystalline, 9: 2788
electrochemical preparation of, 9: 596
electrolytic determinations in organic boron compounds, 9: 2161
electrolytic separation from molten inorganic electrolytic baths, 9: [illegible]
flame photometric determination; effects of acids and methanol concentration and of various anions and cations on, 9: 2173(J)
π-mesonic atoms of, x radiation from, 9: 7082(J)
neutron absorption cross sections, 9: 5762
neutron absorption determination, 9: 4380
neutron elastic scattering and energy levels, 9: 1067(R)
neutron reactions (n,nγ) at 4.5 Mev, γ rays from, 9: 4589(J)
polarographic determination, 9: 4940
proton reactions (p,γ), 9: 1067(R), 1396(J)
proton total cross sections at 208 and 315 Mev, 9: 358(J)
purification of commercial-grade, 9: 7265
spectrographic determination in Ti and Ti alloys, 9: 639(R), 4944
spectrographic determination of, in ores and rocks, 9: 162
thermal neutron absorption cross section, 9: 1632(J), 3284(J)
uptake of, in brain neoplasms, in mice, 9: 7227(J)
volumetric determination, 9: 52
volumetric determination of, in B–Pb system, 9: 6868

Boron–beryllium systems
structure and properties, 9: 6192(J)

Boron bromide addition compounds
properties, in nonaqueous media, 9: 4698

Boron bromides
properties, in nonaqueous media, 9: 4698
reactions with BCl_3, 9: 2629(J)

Boron carbide crystals
x-ray scattering by neutron irradiated, 9: 428
x-ray scattering effects due to lattice defects, 9: 7835(J)

Boron carbides
crystal structure, effects of radiation on, 9: 428
thermodynamic properties, 9: 4719(J)

Boron chloride–carbon tetrachloride systems
interdiffusion coefficients in gaseous systems at 30°C, 9: 4937(J)

Boron chloride complexes
with ethyl ether, electrolytic decomposition, 9: 516

Boron chlorides
chemical reactions of B_2Cl_4 with non-metallic elements and their derivatives, 9: 6870
infrared spectra of B_2Cl_4, 9: 6866(R)
infrared spectra of kinetics of gas-phase BF_3–BCl_3 reaction, 9: 3088
reactions between NH_3 and NaCl and, 9: 4697
reactions with BBr_3, 9: 2629(J)

Boron–chromium–iron–nickel systems
preparation, casting into ingots, and fabrication into strips, 9: 6904

Boron–chromium–molybdenum systems
physical properties, 9: 150(R)
preparation and physical properties of Borolite IV, 9: 7326(R)

Boron–chromium–nickel systems
hardness measurements, 9: 3822(J)
properties of, as high-temperature brazing alloys for thin sheet metals, 9: 1886(J)

Boron–chromium systems
physical properties, 9: 150(R)
preparation and physical properties of Borolite IV, 9: 7326(R)

Boron compounds

bibliographies, 9: 55, 2134, 4063, 6180, 6595

chemical analysis, instrumental methods of, conductometric, polarographic, spectrographic, and volumetric analysis, 9: 1763

chemical reactions and molecular structure of the diammoniate of diborane, 9: 7264

chemical reactions of $NaB(C_6H_5)_4$, 9: 2613

decomposition of mixed diazonium fluoroborates, 9: 4743(J)

electrolytic determinations of B in organic, 9: 2161

neutron absorption analysis of, for B, 9: 4380

nuclear magnetic resonance spectra, 9: 4412

organic, chemical properties and methods of preparation, 9: 1741

organic, preparation, properties, and chemical reactions, 9: 7266(R)

organic, surface tension, density, index of refraction, and atomic parachor, 9: 51

organic, preparations and reactions of heterocyclic, with di-Grignard reagents prepared from pentamethylene bromides, 9: 597

preparation, chemical reactions and molecular structure of the diammoniate of diborane, 9: 7262

preparation and chemical reactions of organo-borohydrides, 9: 4062(R)

preparation and composition of sodium diborane, 9: 7261

preparation of borazole intermediate compounds, 9: 7267(R)

reactions with $(CH_3)_3N$ and other amines, kinetics, 9: 6874

ultraviolet and infrared absorption spectra of organic, 9: 3756

Boron crystals

cleaning, sorting, and mounting of microscopic, for electrical measurements, 9: 1302

Boron fluoride addition compounds

with diethyl ether, chemical reactions, 9: 4057

Boron fluoride–ammonia systems

preparation, properties, and reaction mechanisms, 9: 515

Boron fluoride–carbon tetrachloride systems

interdiffusion coefficients in gaseous systems at 30°C, 9: 4937(J)

Boron fluoride complexes

with ethyl ether, reaction with lithium borohydrides and trimethoxyborine, 9: 3055

Boron fluoride–formamide, *N,N*-dimethyl- systems

chemical and thermal properties and reduction, 9: 2615

Boron fluorides

(See also Ammonia–boron fluoride systems.)

in anhydrous hydrofluoric acid, conductance and vapor pressure of, 9: 867(J)

chemical interactions in system boron trifluoride–n-butyl alcohol–tri-n-butyl borate, 9: 4711(J)

infrared spectra of addition compounds of amines with, 9: 6874

infrared spectra of gas-phase BF_3–BCl_3 reaction, 9: 3066(J)

neutron flux measurements with BF_3 long counter, 9: 7452

preparation and reaction mechanisms, 9: 597

preparation by decomposition of aryl diazonium fluoborates, 9: 4720(J)

reactions with NH_3, dimethylamine, n-butylamine, t-butylamine, and pyridine, 9: 2624(J)

Boron halides

preparation of by reaction of boric oxide with alkali metal halides and alkaline earth halides, 9: 598

Boron hydride–oxygen systems

explosive limits, 9: 4699

Boron hydride poisoning

therapy with various agents, negative results, 9: 53

Boron hydrides

(See also Borohydrides.)

adsorption isobars and isotherms, and decomposition, and preparation, 9: 3891

adsorption of, by silica gel and activated charcoal, 9: 53

chemical properties and methods of preparation, 9: 1741

chemical thermoelectric detector for, 9: 5873

detector for measuring atmospheric pollution by, 9: 98

gasometric determination in air, 9: 6869

infrared spectra of diborane, pentaborane, and decaborane, 9: 7259

isotopic exchange reaction between, and D_2, 9: 1182

nuclear magnetic resonance spectra and structure, 9: 918(J)

oxidation of pentaborane, 9: 4699

preparation and properties of B_4H_{10}, 9: 6866(R)

preparation and reactions with Li, 9: 7266(R)

reactions of diborane with ammonia, 9: 5249

spectrographic determination of, 9: 53

spectrophotometric determination in air and purity determination, 9: 3069

thermal conductometric determination of D in partially deuterated, 9: 1203(J)

toxicity of, for mice, rats, and rabbits, 9: 2606(J)

toxicity of, for rats, rabbits, and dogs, 9: 2607(J)

toxicology, 9: 5873

toxicology of, for laboratory animals and man, 9: 844

toxicology of, in rabbits, dogs, monkeys, mice and humans, 9: 53

ultraviolet-absorption determination, 9: 53

vapor pressure, dielectric properties, and phase studies of diborane and pentaborane, 9: 4700

vibrational spectra and structure of diborane, 9: 7286(J)

Boron iodides

preparation and reaction with NH_3, 9: 515

Boron isotopes B^8

range-energy relations, 9: 408(J)

Boron isotopes B^9

energy levels from $C^{12}(p,\alpha)$ reaction, 9: 5506(J)

Boron isotopes B^{10}

activation determination with α source, 9: 1650(J)

alpha reactions (α,p), 9: 2331(R)

cross section for $B^{10}(p,\alpha)Be^7$ reaction, near 200 kev, 9: 6774(J)

deuteron reactions (d,α), 9: 6050(J)

deuteron reactions (d,γ), energy and intensity of γ rays from, 9: 379(J)

deuteron reactions (d,n), angular distribution of neutrons from, 9: 407(J)

deuteron reactions (d,p), angular distribution and yield of protons from, 9: 406(J)

elastic scattering angular distribution of fast neutrons, 9: 4596(J)

excitation energies of excited states of, 9: 4875(J)

excitation functions for the reactions $B^{10}(p,\gamma)C^{11}$ and $B^{10}(p,\alpha)Be^7$, 9: 7158(J)

gamma reactions (d,γ), spectra, 9: 7121(J)

neutron capture by, in therapy of brain tumors, pathological effects, 9: 4683(J)

neutron reactions, 9: 4535(J)

neutron reactions (n,d) and (p,d), cross sections, 9: 7510(J)

nuclear magnetic moment of, calculated by proton-neutron coupling, 9: 742(J)

proton reactions (p,α), energy levels of Be^7 from, 9: 5506(J)

thermonuclear reactions of protons with, in stars, 9: 3647(J)

Boron isotopes B^{11}

deuteron reactions (d,γ), energy and intensity of γ rays from, 9: 379

deuteron reactions (d,n), 9: 4876(J)

deuteron reactions (d,n), angular distribution and energy spectra of neutrons from, 9: 761(J)

deuteron reactions (d,n), angular distributions, 9: 6491(J)

elastic scattering angular distribution of fast neutrons, 9: 4596(J)

energy levels in, following inelastic scattering of α particles by Li^7, 9: 420(J)

nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)

nuclear magnetic resonance in, 9: 7025(R)

nuclear magnetic resonance spectrum in kernite, 9: 4563(J)

proton reactions (p,α), 9: 6050(J)

proton reactions (p,γ), angular distribution, 9: 2019(J)

thermonuclear reactions of protons with, in stars, 9: 3647(J)

Boron isotopes B^{12}

beta decay, effect of spin-orbit forces, 9: 5158(J)

Boron–lead systems

volumetric determination of B in, 9: 6868

Boron nitrides

electronic structure, theory, 9: 1626(J)

physical and chemical properties, 9: 7329(J)

two-dimensional vibration spectrum, 9: 5189

Boron oxide–lithium oxide–silicon oxide systems

thermal expansion, 9: 1555

Boron oxide–lithium oxide–water systems

phase studies, 9: 4073(J)

Boron oxides

chemical reactions, 9: 2613

heat and free energy of formation, 9: 529(J)

preparation and chemical properties of BO, 9: 4972

reaction of, with alkali metal halides and alkaline earth halides to prepare B halides, 9: 598

vaporization, 9: 2627(J)

vaporization, vapor pressure, and spectra, 9: 2132

Boron polymers

synthesis of borazoles, 9: 7267(R)

Boron steel

corrosion, welding, and mechanical properties, review, 9: 7368(J)

hardenability of, as a function of grain size and B additions, 9: 3857(R)

Boron–zirconium systems

size of interstitial solute atoms, lattice expansion, and electronic properties of close-packed, 9: 1780(J)

Borosilicate glass

thermal conductivity, 9: 946(R)

Bosons

(See also Elementary particles.)

decay of θ^0 particle, charge conjugation in, 9: 3702(J)

interaction with fermions, universality of, 9: 5821(J)

phase transitions in Bose gas, second-order, 9: 4028(J)

Boundary layer

(See also appropriate subheadings under Gas flow.)

control by porous suction, theory, 9: 2695

integral relation for thermal, and its application to heat exchange computations, 9: 5313(J)

in laminar gas flow, mathematical analysis, 9: 3450

measurement of, tracer techniques, 9: 4988

turbulent, calculation in presence of heat transfer, 9: 5317(J)

Bow Knot Area (Utah)

mineralogy, 9: 1829

Brain

effect of x radiation on divisions of, 9: 7614(J)

effects of radiation on brainstem and hypothalamus in primates, 9: [illegible]

effects of radiation on hypothalamus in primates, 9: 833(J)

histological, metabolic, and conditioned-reflex effects of local x irradiation, 9: 2586(J)

localization of injected colloidal Au^{198}, with and without Ag-coating, 9: 1172(J)

metabolism of cholinesterase in, of rats, 9: 61(R)

Brain tumors

boron-disintegration therapy of, in mice, 9: 7227(J)

detection of, simplified apparatus for, 9: 1975(J)

localization of, with radioisotopes, 9: 6584(R)

neutron-capture therapy employing B^{10}, pathological effects, 9: 4883(J)

radiometric localization of, following administration of As^{74}, 9: 5878(J)

radiotherapy, effect of radiosensitivity of brainstem and hypothalamus on, 9: 832(J)

therapy, using radioactive gold particles implanted by stereotaxy, 9: 2127(J)

Brass

(See also Brass–copper couples; Copper alloys.)

alpha and beta, diffusion of Zn and Cu in, 9: 7008(J)

cold working and recrystallization, 9: 4459(R)

corrosion of low-leaded, by alternate exposure to liquid and gaseous fluorine, 9: 4142

creep, grain boundary displacement vs. grain deformations as the rate determining factor in, 9: 6285

creep of β, influence of order-disorder transformations on, 9: 178

critical shear stress, 9: 5382(R)

electrical resistivity, effects of radiation, 9: 7182(J)

fretting corrosion, effect of clamping pressure on, 9: 6262

mechanical properties and resistance to cavitation corrosion in fresh water and sea water, 9: 3148

metallographic etching of, reaction potentials in various etching reagents, 9: 646(J)

polarization of, in 3% NaCl solution, 9: 2259(J)

resistivity of α, 9: 5077

wear resistance with silicone greases, effect of composition on, 9: 1116(J)

Young's modulus, effects of cold deformation on, 9: 2769(J)

Brass–copper couples

interdiffusion of, pores formed during, 9: 5362(J)

Brass powders

resistance sintering under pressure, 9: 1878(J)

Brazing

(See also appropriate subheadings under specific materials; see also Brazing alloys; Soldering; Welding.)

bibliography on, 9: 5360

evaluation of techniques for, of Mo, for high-temperature service, 9: 2781(J)

literature review and industrial survey of, 9: 6282

of titanium and Ti alloys by high-temperature alloy fusion, 9: 645(J)

Brazing alloys

brittle failure of 60% Mn–Ni, causes and prevention, 9: 4169

evaluation of, for Mo for high-temperature service, 9: 2781(J)

for titanium and Ti alloys high-temperature alloy fusion, 9: 645(J)

use of B–Ni–Cr systems as, for thin sheet materials, 9: 1886(J)

Breasts

cancer of, uptake of Au^{198} colloids by axillary metastases from, 9: 7652(J)

Breath

assay of, for C^{14} labeled CO_2 in humans, equipment, 9: 3940(J)

detection of radon in, equipment, 9: 4360(J)

Breeder reactors

(See also Experimental breeder reactors; ZEPHYR.)

design and economic factors associated with, 9: 1701(J)

Bremsstrahlung

(See also appropriate subheadings under specific decay processes, charged particles, and isotopes.)

dependence on atomic number, 9: 6046(J)

detection and measurement of, from liquid samples containing P^{32}, 9: 1981(J)

differential cross sections for, produced by 1-Mev electron in Be and Au, 9: 427(J)

for electrons and photons, modifications to Bethe-Heitler formula for, 9: 6812(J)

energy considerations in study of, 9: 1937(J)

industrial uses of, and possible sources of, 9: 7956(J)

internal, accompanying β emission in Y^{90} and RaE, 9: 6535(J)

internal, in 0–0 transitions, 9: 5140(J)

internal and external, associated with β decay of S^{35}, 9: 2969(J)

low-energy, scintillation spectrometry of, 9: 3260(J)

method for correcting for, and scatter in radiation sources, 9: 7572(J)

multiple production of photons in, cross section for, at high energies, 9: 7176(J)

nuclear reactions, 9: 2449(J)

in penetrating showers produced in Pb and C at 11,200 ft, 9: 1929(J)

photodisintegration of C^{12} by 330-Mev, 9: 4294(J)

polarization, 9: 797(J)

production by π meson collision with nuclei, 9: 7487(J)

production of, effect of finite nuclear size on, 9: 3623(J)

proton cross sections, 9: 7171(J)

reactions with C at 310 Mev, π^+ meson production from, 9: 2434(J)

spatial distribution of energy dissipated by 40-Mev, incident on H_2O, calculation, 9: 422(J)

spectrum from a betatron beam, depth distribution of ionization from, 9: 6407(J)

Bricks

high-alumina, refractory properties for lining ladles, 9: 7753(J)

British reactors

(See BEPO; ZEPHYR.)

Brittleness

(See Ductility.)

Broken Shoe Deposit (Utah)

uranium distribution, 9: 1513

Bromine

crystalline, Zeeman splitting of nuclear quadrupole resonance line in, 9: 1303(J)

isotopic composition in nature, 9: 2346(J)

nuclear quadrupole coupling, 9: 1340(J)

spectrophotometric determination in glacial acetic acid saturated with KBr, 9: 3069

Volhard determination of, in $MoBr_3$, 9: 2792(R)

Bromine–bromine fluoride systems

electric conductivity, 9: 6868

Bromine fluoride–bromine systems

electric conductivity, 9: 6868

Bromine fluoride–hydrofluoric acid systems

solid-liquid equilibria, electrical conductivities, and vapor pressures, 9: 4741

Bromine fluoride systems

liquid-vapor equilibria for BrF_3–BrF_5, 9: 3786

Bromine fluorides

infrared spectra of BrF_3 and BrF_5, 9: 897(J)

magnetic susceptibilities, 9: 4741

preparation, properties, and chemistry of reactions in, 9: 892(J)

Bromine isotopes

mass ratios of, determined from microwave spectra of alkali halides, 9: 811(J)

Bromine isotopes Br^{78}

decay schemes, measurements and interpretation, 9: 3332(J)

Bromine isotopes Br^{79}

electromagnetic separation, 9: 1957

neutron reactions (n,γ) in C_9H_7Br, 9: 5915(J)

nuclear quadrupole resonance of, in bromobenzene derivatives, 9: 2012(J)

Bromine isotopes Br^{80}

competing β^+ and β^- decay in, and decay scheme, 9: 6512(J)

formation from (n,γ) reaction on Br^{79}, 9: 5915(J)

isomers, retention difference in liquids, 9: 7109(J)

radioactivity, 9: 3965(R)

Bromine isotopes Br^{81}

electromagnetic separation, 9: 1957

gamma reactions (γ,α), 9: 3674(J)

neutron reactions (n,γ) in C_9H_7Br, 9: 5915(J)

nuclear quadrupole resonances for, in $AsBr_3$, 9: 2900(J)

nuclear quadrupole resonance of, in bromobenzene derivatives, 9: 2012(J)

Bromine isotopes Br^{82}

formation from (n,γ) reaction on Br^{81}, 9: 5915(J)

Bronze

(See also specific bronzes identified with the elements, e.g., Aluminum bronze; see also Copper-tin alloys.)

mechanical properties and resistance to cavitation corrosion in fresh water and sea water, 9: 3148(J)

Brookhaven National Lab., Upton, N.Y.

annual report for 1954, 9: 4038(R)

atmospheric turbulence study, 9: 341

environs monitoring, radiation detection instruments, maintenance, and results, 9: 6400

progress reports, 9: 1781(R), 4039(R), 5206(R)

progress reports on unclassified research, 9: 2099(R)

progress reports on waste development project, 9: 3120(R)

Brookhaven Reactor

reference material on, 9: 6479

Brookhaven Synchrotron

beam deflection and focusing, 9: 1366

experimental program and maintenance, 9: 2099(R)

modifications during shutdown, 9: 5206(R)

neutron spectra, 9: 4039(R)

remanent magnetism in, 9: 7166

Brooklyn. Polytechnic Inst.

progress reports on high-value insulators, 9: 3388(R), 3888(R)

progress reports on radioinduced polymerization, 9: 4958(R)

Brownian movement

correlation functions in theory of, 9: 7968(J)

Brule Formation (S. Dak.)

geology and U distribution, 9: 3158(J)

Brushy Basin Member (Colo.)

exploration of, in Wray Mesa, 9: 1513

Brushy Basin Member (Colo.) (cont'd)
geology of, in Horse Range Mesa Quadrangle, 9: 7775(J)
Brushy Basin Member (Utah)
geology of, 9: 160
Brushy Basin No. 1 Open Pit (Colo.)
uranium and V distribution, 9: 1513
Brushy Basin No. 3 Open Pit (Colo.)
uranium distribution, 9: 1513
BSR
(See Bulk Shielding Facility.)
Bubble chambers
(Device for the detection of radiation by the formation of bubble tracks in superheated liquids.)
design, theory, and preliminary experiments, 9: 5114
glass and metal liquid propane, design and performance, 9: 5426
liquid hydrogen, development, 9: 2890(R), 3966(R)
operation and characteristics, 9: 2425(J)
plexiglas windows for, strength of, 9: 6416(J)
principle, construction, and uses of, 9: 6419(J)
propane, particle tracks in, 9: 2422(J), 4851(J)
Bubbles
(See also appropriate subheadings under Boiling.)
adhesion of air, to hydrophobic surfaces in water, theoretical analysis of, 9: 148(J)
break-away cavitation behind cylinders, mathematical analysis, 9: 3127(J)
formation, kinematic structure of break-away, on a circular profile 9: 3217
formation, theory and mathematical analysis of, in water, 9: 6249(J)
motion of air, in aqueous media, 9: 4980
motion of air, in various liquids, 9: 6244
pressure and erosion in cavitation region, 9: 1241(J)
shapes of cavitation region on a transverse foil in a normally incident stream, 9: 3128(J)
structure of the cavitation region, 9: 1240(J)
vapor, in liquids in metastable thermodynamical equilibrium and under ion bombardment, 9: 2663(J)
velocity of rising, of vapor in boiler tubes, 9: 7400(J)
Buckhorn Mica Mine (Colo.)
geophysical exploration and geology, 9: 3157(J)
Buckland–Kiwalik District (Alaska)
uranium distribution in, 9: 1523(J)
Building materials
(See also specific materials.)
alpha radioactivity in, 9: 445(J)
compressive, bearing, and shear creep-rupture properties of, at elevated temperatures, 9: 5361
corrosion resistance to liquid Na, 9: 5647(J)
effects of radiation, facility for testing at Brookhaven, 9: 4621(J)
stress-corrosion of, in high-temperature water, 9: 4782
survey, corrosion data charts, and directory, 9: 137(J)
Bulbs
effects of radiation on growth and salt uptake by, 9: 26(J)
Bulk Shielding Facility
beam hole and partial reflector reactivity effects, 9: 7150
control rod calibration, 9: 7150
design and nuclear characteristics, 9: 2907
neutron and γ radiation from, attenuation by water, 9: 7957
gamma and neutron radiation attenuation from, 9: 7151
Bulk Shielding Facility (cont'd)
operating characteristics, 9: 4869
power calibration and neutron flux measurements, 9: 1641
reactivity measurements with water-reflected lattice, 9: 750
temperature coefficient, control rod calibration, power level experiments, and poisoning, 9: 750
Bullsnake Claim (Calif.)
geology, 9: 3837(J)
Bureau of Mines. Fuels Technology Div., Pittsburgh
progress reports on flow properties of fine particles, 9: 4128(R)
Burns
(See also subheadings for biological effects under specific radiations. See also Radiation effects and Thermal Radiation Effects under specific tissues and materials.)
circulatory disturbances following, in dogs, 9: 5210
cutaneous, production, influence of optical properties of skin, 9: 6154
effects of, on erythrocyte destruction in rats, tracer study, 9: 6592
erythrocyte deficiency induced by, 9: 4913
flash, protective effects of fabrics against, 9: 481
flash, tungsten lamp source suitable for production, design, 9: 4503(J)
produced in rabbit ears by exposure to thermal radiation, determination of severity by uptake of injected P^{32}, 9: 6566
production, time-energy relationship, 9: 5212
production of, of skin, effects of color in swine, 9: 4045
production of, on porcine skin, protection afforded by shielding with cotton fabric, 9: 5572
protective effects of a light poncho material against, 9: 4050
radiant energy, of skin, protection afforded by fabrics, in pigs, 9: 1187
of skin, effects of adrenalectomy on, in rats, 9: 4664
Burro Canyon Formation
geology of, in Horse Range Mesa Quadrangle, 9: 7775(J)
stratigraphy, 9: 5327(J)
Burros
lethal effects of radiation, 9: 2567(J)
lethal γ radiation dosage determinations and pathological effects of γ radiation on, 9: 5847(J)
Butadiene polymers
properties and synthesis, 9: 6210(R)
Butane
diffusion in silica, dependence on temperature, porosity, and surface concentration, 9: 4755(J)
1-Butanol
adsorption isotherms of, on lampblack, 9: 6683(J)
chemical interactions in system boron fluoride–n-butyl alcohol–tri-n-butyl borate, 9: 4711(J)
1-Butanol–water systems
mass transfer in a horizontal liquid-liquid extraction tube, properties affecting the film coefficients of, 9: 2208
2-Butanone–water systems
mass transfer in a horizontal liquid-liquid extraction tube, properties affecting the film coefficients of, 9: 2208
Butcher Hollow (Penna.)
mineralogy and U distribution, 9: 164(J)
Butler Wash Group (Utah)
mineralogy, 9: 1829
Butter yellow
(See Azobenzene, dimethylamino-.)
Butyl borates
chemical interactions in system boron trifluoride–n-butyl alcohol–tri-n-butyl borate, 9: 4711(J)

Butyl phosphate–acetone, thenoyltrifluoro-–kerosene systems
solvent extraction of Pr and Nd in, 9: 906
Butyl phosphate–kerosene systems
mechanism of U extraction by, 9: 585
solvent extraction of Pr and Nd in, 9: 906
Butyl phosphate–nitric acid systems
solvent properties of, for rare-earth nitrates, 9: 901
Butyl phosphate–nitric acid–uranyl nitrate systems
uranium solvent extraction from, performance of a louvre-plate redistributor for large-diameter pulse columns in, 9: 588(J)
Butyl phosphates
mechanism of U extraction by, 9: 585
solvent extraction of U with, 9: 7310
Butyric acid, heptafluoro-
chemical reactions with C_4H_9Li in ether, 9: 5928(J)
Butyric acid, heptafluoro-, silver salts
crystal structure, 9: 6211
Butyric acid–water systems
activity coefficients, 9: 4713(J)

C

Cables
noise, test for, due to shock, vibration, or transient pressures, 9: 5679
Cache Creek Area (Alaska)
exploration for radioactive deposits, geology, mineralogy, 9: 5650(J)
Cadmium
absorption of cosmic μ mesons, 9: 721
coulomb excitation, 9: 1066(R)
cross sections for neutron transmission and multiplication, 9: 3646(J)
differential neutron elastic scattering cross sections at 4.1 Mev, 9: 4597(J)
diffusion of, in single crystals of Ag, tracer study, 9: 668(J)
elastic scattering of polarized protons from, 9: 4893(J)
electrical and thermal conductivities of, near 225°K, 9: 637
electrodeposition on motorettes, procedure for, 9: 1554(R)
electroforming from fluoborate and cyanide baths, 9: 3495
electron and positron absorption in, 9: 415(J)
energy levels study by means of electric excitation by protons, 9: 5476(J)
gamma spectrum after thermal neutron capture, 9: 7907(J)
growth of whiskers by vapor deposition on glass, 9: 7816(J)
heat of solution, in liquid Sn, 9: 4178
isotope shift in λ4415 Cd II, 9: 453(J), 4334(J)
lattice and grain boundary self-diffusion in, 9: 3188(J)
neutron differential scattering cross sections at 3.7 Mev, 9: 4204(R)
neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)
neutron resonances, 9: 1073(J)
nuclear isomers, 9: 1067(R)
photon scattering cross section, 9: 4205(R)
photoneutron yield, measurement with NaI crystal, 9: 3944(J)
proton range in, 1- to 7-Mev, 9: 6788(J)
quantitative determination of divalent, using a high-frequency oscillator and ethylenediaminetetraacetic acid, 9: 2169(J)
radiochemical determination, 9: 876
radiometric determination, 9: 2634
secondary electron production from, by Cd ions, 9: 1562(J)
solid-solubility curve of, in Zn, 9: 2770(J)
Cadmium (cont'd)
spectrographic determination in Bi, 9: 1475
spectrographic determination of, in ores and rocks, 9: 162
Cadmium–aluminum alloys
creep, activation energies for, 9: 5961
Cadmium–aluminum–copper alloys
metallurgy, corrosion behavior, and applications, 9: 6324(J)
Cadmium arsenides
electric conductivity, 9: 1467(R)
Cadmium chelates
with 2,4-pentanedione, formation constants, enthalpy, and entropy, 9: 3390(J)
Cadmium chloride–potassium chloride system (liquid)
electric conductivity, 9: 2139(J)
Cadmium chloride–water–zinc chloride systems
activity coefficients at 25°C, 9: 3795(R)
Cadmium coatings
on steel, corrosion and weldability of, 9: 171
Cadmium compounds
polarographic behavior of, in molten ammonium formate, 9: 7292
Cadmium crystals
effects of α irradiation on creep and hardness of, 9: 433(J)
mechanical properties, effect of oxide films on, 9: 7007(J)
plastic deformation in, effect of size on, 9: 7834
Cadmium–gold alloys
cubic to orthorhombic diffusionless phase changes in, 9: 3885(J)
diffusionless phase transformation, crystal structure, electric conductivity, thermal expansion, ferro-elastic behavior, effects of shear, bending, thermal, compression and tensile stresses, and heat treatment, 9: 1861(R)
elastic properties of, temperature dependence, 9: 5054
electrical resistivity, effect of quenching, 9: 5382(R)
partial vapor pressure of Cd and thermodynamic properties, 9: 4454
Cadmium iodides
low-temperature heat capacity and entropy of, 9: 3221(J)
Cadmium ions
equilibrium formation constants for reaction in aqueous solution of acetylacetonate ion with, 9: 1752(J)
secondary electron production from Cd targets by, 9: 1562(J)
Cadmium isotopes
electric excitation energy levels and pulse height spectra, 9: 4205(R)
excited states of, by Coulomb excitation, properties of, 9: 5483(J)
use in standard wave length light sources, 9: 6717(J)
Cadmium isotopes Cd^{106}
deuteron reactions (d,n), In^{107} production from, 9: 7104
Cadmium isotopes Cd^{113}
K-shell internal conversion coefficients and multipolarity assignments, 9: 5535(J)
Cadmium isotopes Cd^{111}
angular correlations, effect of electric quadrupole interactions and magnetic I-J coupling, 9: 3622
effect of electric quadrupole interaction on γ-γ correlation, 9: 2482(J)
gamma-γ cascade, analysis of, 9: 6468(J)
gamma emission, directional correlation, 9: 7893(R)
gamma-γ cascade of, experiments on, 9: 6467(J)
hyperfine structure and Cd^{113}/Cd^{111} magnetic moment ratio, 9: 453(J)
magnetic moment of the 247-kev excited state of, 9: 3282(J)
nuclear magnetic moment of 247 kev excited state, 9: 7893(R)
nuclear quadrupole interactions, 9: 2898(J)
nuclear quadrupole moments by γ-γ angular correlations, 9: 1348(J)

Cadmium isotopes Cd^{113}

hyperfine structure and Cd^{113}/Cd^{111} magnetic moment ratio, 9: 453(J)

Cadmium isotopes Cd^{114}

gamma-gamma cascade in perturbed directional correlation of, 9: 7117(J)

Cadmium isotopes Cd^{115}

disintegration of, 9: 1347(J), 3335(J)

Cadmium isotopes Cd^{116}

double β decay, 9: 7190(J)

double beta or positron decay, in lower limit of half-life for, 9: 6124(J)

Cadmium–magnesium alloys

ordering in, 9: 637

thermodynamic properties, 9: 2735(R), 7351(R)

Cadmium oxides

heat and free energy of formation, 9: 529(J)

Cadmium–silver alloys

diffusion coefficients for, 9: 5348(R)

heat of formation, 9: 4178

heat of solution, in liquid Sn, 9: 4178

partial vapor pressure of Cd and thermodynamic properties, 9: 4454

vapor pressures over solid α, equipment for measuring, 9: 3177(R)

Cadmium sulfates

heat capacities from 15° to 315°K and heats of hydration, 9: 4934(J)

Cadmium sulfide crystals

detecting element in radiation probe of high resolution, radiation response of, 9: 1333(J)

use as radiation detectors for medical radiology, 9: 5434(J)

Cadmium sulfides

growth of whiskers by vapor deposition on glass, 9: 7816(J)

fluorescence and phosphorescence of ZnS:CdS phosphors, influence of alternating electric fields on, 9: 7075(J)

Cadmium tungstate crystals

luminescent efficiencies, 9: 232(R)

production in Verneuil furnace, 9: 1932(J)

Cadmium–zinc alloys

lattice parameters of quenched, 9: 2770(J)

Calamity Mesa Quadrangle (Colo.)

preliminary geologic map of, 9: 4155(A)

Calcite

reflectivity for thermal neutrons, 9: 7833

Calcium

bone deposition of, in adult dogs and rats, tracer studies, 9: 5721(R)

bone deposition of, in rats and monkeys, tracer study, 9: 3730(R)

charge equilibrium ratios for H ions from proton bombarded, 9: 2486(J)

chemical analysis for O_2, 9: 3070

chromatographic determination of, in mixtures of Na, K, Mg, and Ca, 9: 3400(J)

deuteron reactions (d,p), 9: 2331(R)

effects of deficiency of, on chromosome breakage in Tradescantia, 9: 3006(J)

effects of dietary, on bone deposition of Sr^{90}, 9: 846

effects of dietary, on metabolism of Ca and P in rats, and excretion of Sr in milk of dairy cows, tracer studies, 9: 1156(R)

elastic scattering of high-energy polarized protons by, 9: 4885

exchange with Ra in prototype bone apatite, 9: 847

excretion of, in Wilson's disease, effects of Ca EDTA on, 9: 1739

foliar absorption and metabolism of, in strawberries, tracer study, 9: 3751

gamma reactions (γ,n) and (γ,p), cross sections, 9: 3301(J)

Calcium (cont'd)

ion exchange separation and titrimetric determination of Li, K, and Na in presence of, 9: 1200(J)

isotope abundances in certain minerals, 9: 4234(R)

isotopic exchange between tricalcium phosphates and solutions of, tracer study, 9: 90(J)

metabolism of, effects on microstructure of collagen in rat tails, 9: 3(R)

metabolism of, in plants and animals, tracer studies, 9: 1156(R)

μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)

nephelometric and gravimetric determination of small amounts of, in Ti alloys, 9: 4942

preparation and allotropic modifications of, 9: 4949

radiochemical determination, 9: 876

reduction of MoO_3 by, 9: 5676(J)

tissue distribution of, in cattle, tracer study, 9: 1156(R)

uptake of, by bean plants, effects of environmental factors, 9: 4056

x-ray spectra (soft), 9: 452(J)

Calcium–aluminum alloys

as container material for Ti, evaluation, 9: 4780

Calcium carbonates

(See also Calcites; Limestone.)

activity, heat of mixing, heat of fusion, and melting point of, in mixtures of fused salts, 9: 1744

moderation of fast neutrons in, 9: 3999(J)

precipitation of, 9: 4995

Calcium chloride–lithium chloride–potassium chloride systems

phase studies, 9: 4059

Calcium chlorides

diffusion coefficients for aqueous solutions of, at 25°C, 9: 109(J), 4070(J)

diffusion coefficients of, in dilute aqueous solution, 9: 7268

Calcium compounds

hydroxyfluoberyllates, preparation and properties, 9: 5900(J)

polarographic behavior of, in molten ammonium formate, 9: 7292

Calcium–copper alloys

crystal structure, 9: 683(J)

Calcium fluoride–calcium iodide systems

partial phase diagram of, 9: 514

Calcium fluoride–calcium oxide systems

electric conductivity and phase diagrams, 9: 1471(J)

Calcium fluoride crystals

orientation of Eu ions in, 9: 1934(J)

Calcium fluoride–lithium fluoride–magnesium fluoride systems

phase studies, 9: 7707

Calcium fluoride–lithium fluoride systems

phase studies, 9: 7708

Calcium fluorides

adsorptive properties, 9: 50

coloration and luminescence, 9: 4314(J)

dense polycrystalline samples, preparation, 9: 4779(R)

lattice constants, 9: 3408

sintering behavior, 9: 2702(R)

Calcium hydrides

reaction with water, 9: 6189(J)

Calcium hydroxides

energy loss of 22-kev electrons, 9: 1665(J)

Calcium iodide–calcium fluoride systems
partial phase diagram of, 9: 514
Calcium ions
activity measurements with resin membrane electrodes, 9: 2149(J)
elution behavior of, from sulfonic acid resins, 9: 5298(J)
Calcium isotopes
deuteron reactions (d,p), angular distributions, 9: 4205(R)
separation of, by ion exchange, separation factors, 9: 290(J)
Calcium isotopes Ca^{39}
beta emission, 9: 1121
beta spectrum, 9: 4266(R), 5755(R)
decay and half lives, 9: 1680(J)
half life, 9: 2951
Calcium isotopes Ca^{40}
gamma reactions (γ,p) and (γ,n), yield ratios, 9: 3300(J)
nuclear pairs from 3.4-Mev state in, 9: 5539(J)
Calcium isotopes Ca^{42}
energy levels, 9: 1066(R)
energy levels of, from K^{39} (α,p) reaction, 9: 2441(J)
Calcium isotopes Ca^{43}
deuteron reactions (d,p), ground state Q values from, 9: 2441(J)
Calcium isotopes Ca^{44}
energy levels, 9: 1066(R)
energy levels of, from K^{41} (α,p) and Ca^{43} (d,p) reactions, 9: 2441(J)
Calcium isotopes Ca^{45}
excretion, following simultaneous injection with Ra^{224}, 9: 2547(R)
excretion of Ca ion studied by, 9: 6593(J)
specific activity measurement, 9: 6728(J)
toxicity of, in mice, 9: 6820(R)
Calcium isotopes Ca^{48}
double beta decay in, 9: 3683(J)
energy levels, 9: 2331(R)
Calcium isotopes Ca^{49}
energy levels, 9: 1066(R)
Calcium–magnesium alloys
mechanical properties, rolling, and structure, 9: 4160(R)
Calcium–nickel alloys
crystal structure, 9: 683(J)
Calcium oxide–aluminum oxide–silicon oxide systems
electrolysis of slags of, containing S, 9: 2135(R)
Calcium oxide–calcium fluoride systems
electric conductivity and phase diagrams, 9: 1471(J)
Calcium oxide–magnesium oxide systems
magnetic susceptibility of, at elevated temperatures, 9: 996(J)
Calcium oxide–uranium oxide systems
oxidation of, phase diagrams, 9: 1796(J)
Calcium oxide–zirconium oxide systems
fluorite phase in, 9: 6886(J)
phase studies, 9: 4781(J)
Calcium oxides
dielectric properties and solid-state reactions of, with binary, ternary, and quarternary systems of MgO, SnO_2, and TiO_2, 9: 3820(J)
fabrication, hydration, refractory properties, and thermal expansion, 9: 945(R)
bismuth activated, absorption and emission spectra of, 9: 6545(J)
Calcium phosphates
isotopic exchange between tri-, and phosphate or Ca solutions, 9: 90(J)
Calcium sulfates
concentration of O^{18} in water of crystallization, 9: 2267(J)
Calcium titanates
heat capacities and entropies at 298.16°K, 9: 4374(J)
thermal expansion and x-ray diffraction analysis, 9: 945(R)
Calcium tungstate crystals
luminescent efficiencies, 9: 232(R)
production in Verneuil furnace, 9: 1932(J)
Calcium uranates
oxidation of, phase studies, 9: 1796
Calcium–zinc alloys
crystal structure, 9: 683(J)
Calculators
(See Computers.)
Calf Mesa Area (Utah)
mineralogy, 9: 1829
Calibration
of survey radiac meters, design of instrument for, 9: 6405
California (Kern Co.)
uranium distribution in the Silver Lady Claims in, 9: 3154
California (San Bernardino Co.)
geology of U occurrence in Jeep No. 2 Claim in, 9: 2708
rare earth deposits in Mountain Pass District in, 9: 3837(J)
California Inst. of Tech., Pasadena. Jet Propulsion Lab.
progress reports on a constitution diagram for Ti–Sn alloy, 9: 2281(R)
California. Univ., Berkeley. Donner Lab.
progress reports on radioactivity in thyroids of various animals, 9: 7249(R), 7250(R)
California. Univ., Berkeley. Minerals Research Lab.
progress reports on fracture of Mg alloys at low temperature, 9: 3172(R)
progress reports on glass-to-metal bonding, 9: 6646(R)
California. Univ., Berkeley. Radiation Lab.
progress reports, 9: 6035(R)
progress reports from Chemistry Division, 9: 61(R), 4705(R), 7273(R)
progress reports from Physics Div., 9: 2890(R), 3966(R)
progress reports on Bevatron operation and development, 9: 3664(R), 5509(R)
progress reports on medical and health physics activities, 9: 2551(R), 3730(R), 5571(R), 7232(R)
progress reports on radioactivity in thyroids of various animals, 9: 7249(R), 7250
California. Univ., Livermore. Radiation Lab.
progress reports on loading of Ti with deuterium, 9: 5280(R)
California. Univ., Los Angeles
progress report on transients in boiling systems, 9: 936(R)
progress reports, 9: 1723(R), 6155(R)
Californium
(See also Transplutonic elements; Transuranic elements.)
chelation with thenoyltrifluoroacetone, 9: 924(J)
properties of, as predicted by the periodic law of chemical elements, 9: 6909(J)
Californium isotopes
disintegration, 9: 4976
spectra, fast coincidence studies of, 9: 2136(R)
Californium isotopes Cf^{246}
alpha and γ spectra, 9: 4320(J)
decay shcemes and nuclear spectra, 9: 4963
gamma spectra, 9: 7272(R)

Californium isotopes Cf^{249}

decay and half lives, 9: 1489(J)

decay schemes and nuclear spectra, 9: 4863

gamma spectra, 9: 4705(R)

Californium isotopes Cf^{250}

alpha spectra, 9: 4705(R)

decay, half lives, and neutron capture cross sections, 9: 1489(J)

decay schemes and nuclear spectra, 9: 4863

Californium isotopes Cf^{251}

neutron capture cross sections, 9: 1489(J)

Californium isotopes Cf^{252}

alpha spectra, 9: 4705(R)

decay, half lives, and neutron capture cross sections, 9: 1489(J)

decay schemes and nuclear spectra, 9: 4863

fission yields in spontaneous fission of, 9: 3633(J)

spontaneous fission, neutron number and multiplicity distributions from, 9: 5308(J)

spontaneous fission, neutron number distribution from, 9: 2021(J), 2452(J)

Californium isotopes Cf^{253}

half lives, 9: 1489(J)

Calorimeters

for absolute measurement of γ quanta during β decay, 9: 1972(J)

adiabatic, for use with condensable gases and gas-solid systems between 10 and 150°K, design, 9: 2390(J)

adiabatic low-temperature, design and performance, 9: 6866(R)

adiabatic specific-heat, design and construction of, 9: 2735(R)

design and construction, 9: 185

design and operation, 9: 6286(R)

design and performance of vacuum jacket precision, for determination of heats of combustion, 9: 278(J)

design of differential solution, 9: 3867(R)

design of isothermal jacket micro-, for heat effects of long duration, 9: 1586(J)

design of micro, for heat of solution measurements, 9: 6720(J)

differential type, to measure U^{235} fission fragment energy, 9: 5832(J)

isothermal-adiabatic low-temperature, design and performance, 9: 2385

liquid-Sn solution, design and operation, 9: 4178

for measurement of intense beams of thermal radiation, design, 9: 6406

micro-, design and performance, 9: 5295(J)

micro-, design and use in heat of adsorption measurements, 9: 4830

nickel, design, 9: 5247(R)

radiation balance, for comparison of radium standards, 9: 1050(J)

Calutrons

(See also Electromagnetic separation.)

automatic control system to prevent or suppress sparking flurries in, 9: 8014(P)

control of oscillating electrons in, apparatus for, 9: 8003(P)

design, patent of E. O. Lawrence on, 9: 5565(P)

design and performance, 9: 7998(P)

design of an electron emitter filament for, 9: 8020(P)

development of, containing multiple ion sources, 9: 8011(P)

electrical control circuit in the ion source, 9: 7995(P)

electrical discharge in ion source, automatic control, 9: 7996(P)

electron emission from Gd-coated filaments, 9: 2794

insulation and support of ion beam transmitters in, 9: 8007(P)

insulators, power supplies, and high voltage sparking, 9: 656

ion source in, structure, 9: 8008(P)

manual of vacuum systems and techniques, 9: 145

multiple-beam type, ion source for, 9: 8013(P)

Calutrons (cont'd)

operation, accelerating electrode adjustment in, 9: 8004(P)

short circuit elimination in, 9: 8000(P)

slit cleaning mechanism for, 9: 8012(P)

space charge neutralization in, apparatus for, 9: 7997(P)

temperature control for ion source, 9: 7994(P)

vaporization of charge material in, apparatus for, 9: 8019(P)

Cameras

(See also Electron cameras; Photography; X-ray cameras.)

design and performance of fifteen million frame per second, 9: 1017

rotating mirror, design and operation, 9: 4208

rotating-mirror framing, for studying detonation phenomena, design, 9: 2384

synchronized timer for, 9: 5553(P)

Cameron Area (Ariz.)

mineral determinations in U deposits and prospects in, 9: 5948(R)

mineralogy, 9: 1829

Canada

fall-out monitoring in, following Operation Teapot, 9: 7636

gadolinium minerals distribution in, 9: 7335

Canada. Department of Mines and Technical Surveys. Mines Branch.

progress reports, 9: 6650(R)

progress reports of Radioactivity Div. 9: 4996(R)

Cancer

(See Carcinomas; Tumors.)

Cancer-inducing agents

(See Carcinogens.)

Candy and Cake Claims (Calif.)

geology, 9: 3837(J)

Cannizzaro reaction

hydrogen isotopic effects in, 9: 6208(J)

Canon City Embayment Area (Colo.)

geophysical exploration, 9: 7757

Capacitors

life of, in radiation detection instruments, 9: 1329(J)

Cape Mountain Area (Alaska)

uranium distribution in, 9: 1523(J)

Capillaries

(See also Blood vessels.)

formation of new, following trauma of skin, effects of x irradiation on, in mice, 9: 2561(J)

fragility, effects of irradiation, heparin injection, trypsin injection, and peptone shock on, in frogs, 9: 5231(J)

Knudsen flow through, equation for, 9: 5939(J)

permeability of, in perfused rat tissues, effects of adrenal hormones, 9: 4661(J)

Capitol Reef Area (Utah)

geochemical prospecting, 9: 5047(J)

Caproic acid

adsorption on Ag from aqueous solutions as inferred from H_2 overvoltage measurements, 9: 595(J)

synthesis of 4,6-dithiol caproic acid and bisnor-thioctic acid, 9: 618

Caprylic acid

adsorption on Cu and Ag from aqueous solutions as inferred from H_2 overvoltage measurements, 9: 595(J)

Caprylic acids, thio-

decomposition, effects of radiation on, and metabolism, 9: 7272(R)

effect of, on the Hill reaction in intermittent light, 9: 5569

labeled with S^{35}, preparation and radiolysis, 9: 5289

preparation and radiation decomposition, 9: 2136(R)

Caprylic acids, thio- (cont'd)
synthesis and chemical properties, 9: 4973
synthesis and radiation chemistry, 9: 4705(R)
Carbamic acid, diethyldithio-
as reagent in colorimetric determination of metals, 9: 4077(J)
Carbide crucibles
preparation and properties of Ti, Zr, V, Nb, Ta, and W, for molten Ti, 9: 2247
Carbides
(See also specific carbides.)
metal, mutual solubility of refractory, 9: 5945(J)
polishing of, with alumina abrasives, technique, 9: 3879(J)
properties and reactor applications, 9: 6476
thermodynamic properties, 9: 4704
Carbohydrates
(See also Sugars.)
biosynthesis of, by plants, tracer studies, 9: 4363
effects of radiation on, review of literature, 9: 2549
metabolism in animals studied by C^{14}, 9: 7664(J)
Carboloy
(See Tungsten carbides.)
Carbon
(See also Carbon black; Diamonds; Graphite.)
angular distribution of 19-Mev deuterons scattered by, 9: 795(J)
angular neutron elastic scattering cross sections at 2.7 Mev, 9: 4595(J)
asymmetries in p-n-p double charge-exchange scattering on, 9: 7173(J)
asymmetry in p-n and p-p scattering from, with 285-Mev polarized protons, 9: 7174(J)
atomic form factors, calculation and survey, 9: 7407(J)
electroluminescence from alternating electric fields, 9: 1974(J)
attenuation cross sections for 660-Mev protons, 9: 7172(J)
attenuation of 190-Mev deuterons, 9: 778
backscattering from, bombarded by 1- and 2-Mev electrons, 9: 2041(J)
bombardment by high-energy protons, deuterons, and He^3 particles, neutron production from, 9: 1993(J)
bremsstrahlung reactions (γ,π) at 310-Mev, 9: 2434(J)
combustion determination in C–Ti system, 9: 1859(R)
combustion determination in highly fluorinated organic compounds, 9: 2186(J)
cosmic showers under, production, 9: 4489
cross sections for neutron transmission and multiplication, 9: 3646(J)
crystal structure, mechanical properties, and thermal expansion, 9: 91
determination of micro amounts, use of capillary trap in, 9: 6908(J)
differential elastic scattering cross section for α particles, 9: 418(J)
differential neutron elastic scattering cross section, 9: 4590(J)
differential neutron elastic scattering cross sections at 4.1 Mev, 9: 4597(J)
diffusion in C–Fe systems, influence of Co, 9: 1869(J)
diffusion in steel, measurement using C^{14}, 9: 7792(J)
diffusion in ternary metallic systems, measurements and theory, 9: 4214(J)
diffusion in Ti, 9: 1859
diffusion of, in graphite crystals, tracer study, 9: 6204
elastic scattering of high-energy polarized protons by, 9: 4685
elastic scattering of 1.92- to 3.84-Mev neutrons by, 9: 3998(J)
elastic scattering of polarized protons from, 9: 4893(J)
emission of secondary electrons (δ rays) by 1.3-Mev electron bombardment, 9: 1306(J)
energies of K transitions of π^--mesonic x rays from, 9: 1909(J)
Carbon (cont'd)
energy loss of secondary electrons in a cavity with walls of, 9: 2045(J)
external bremsstrahlung emitted from P^{32} β rays stopped in, 9: 2505(J)
finely crystalline, structure and properties, 9: 7043(J)
formation of, from pyrolysis of benzene and toluene, 9: 5905(R)
gamma absorption by, direct measurement of energy of, 9: 7462(J)
gamma reactions (γ,π), 9: 3966(R)
gamma scattering cross sections at 77 and 94 Mev, 9: 2331(R)
graphitization of, prepared by pyrolysis of benzene and toluene, 9: 5905(R)
heat of formation of 3π state of C_2, 9: 4704
heat of vaporization, 9: 988(R)
impurity in aluminum, micro-determination of, 9: 6314(J)
incorporation of, in rat livers, effect of irradiation on, 9: 5852(J)
inhaled, metabolism in rats, tracer study, 9: 2611(J)
isotopic composition of, in carbonaceous meteorites, 9: 1834(J)
mesic x rays from, proportional counter detection of, 9: 7870(J)
μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)
π-mesonic atoms of, x radiation from, 9: 7082(J)
metabolism by plants, tracer study, 9: 48
metabolism of, in animals, apparatus for tracer studies, 9: 7653
neutron absorption and total cross sections at 1.4 Bev, 9: 5486(J)
neutron distribution in, from a fast neutron source, 9: 411(J)
neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)
neutron production by 190-Mev deuterons, 9: 778
neutron reactions (n,π), 9: 6737(J)
neutron reactions (n,π^0), 400 Mev cross section, 9: 5742(J), 6011(J)
neutron total cross sections, 9: 2457
nuclear photoeffect from 75-Mev photons, 9: 5150
nuclear structure, 9: 4560(J)
nucleon total scattering cross sections, 9: 3673(J)
oxygen transfer between CO_2 and CO in presence of, from 650 to 900°C, 9: 526(J)
π^--photomeson production from, 9: 4859
photon reactions (γ,n), 250 Mev, 9: 6772(J)
photonuclear reactions, 9: 2449(J)
polarization and scattering of D–D neutrons, 9: 2481(J)
polarization of high-energy protons in elastic scattering on, 9: 789(J)
preparation from pyrolysis of benzene and factors affecting graphitization, 9: 5904(R)
preparation of radiation targets of, by heating Ni foils in presence of CH_3I, 9: 242(J)
proton reactions at 140 Mev, 9: 5800(J)
proton reactions (p,d) at 95 Mev, angular distribution of pickup deuterons from, 9: 4307(J)
proton reactions (p,H^4) at 300 Mev, search for, 9: 6079(J), 6769(J)
proton reactions (p,π) at 657 Mev, 9: 6737(J)
proton total cross sections, 9: 2458
proton total cross sections at 308 and 315 Mev, 9: 358(J)
reaction with α-particles and deuterons, 9: 5761(J)
removal from TiC by flotation, 9: 2703(R)
resonances in elastic scattering of protons on, 9: 6059(J)
respiratory patterns of, in animals, tracer study, 9: 4705(R)
role of, in plant photosynthesis and respiration, 9: 3048
simultaneous combustion determination of C^{14} activity and total, 9: 4728(J)
slowing down of polarized protons by, 9: 2039(J)
sources, bonding, fabrication, and metallurgical uses, 9: 2303(J)

Carbon (cont'd)

thermodynamic functions of, to 12,000°K, 9: 1896

toxicity of, in lungs of guinea pigs, 9: 6859(J)

Carbon (activated)

(See also Charcoal.)

absorption of boron hydrides by, 9: 53

capillary condensation in, mechanism of, 9: 6683(J)

crystal structure, 9: 7043(J)

protective action of the first layers of, in absorbent bed, time of, 9: 4411

Carbon–aluminum–titanium systems

mechanical properties, 9: 3854(R)

Carbon–aluminum–titanium–vanadium systems

tensile properties, 9: 3853(R)

Carbon black

adsorption of hydrocarbons from methanol and ethanol solutions by nonporous, 9: 1790

heats of adsorption of argon on, graphitized at successively higher temperatures, 9: 2677

replicas of, technique, 9: 262

Carbon–cobalt–iron systems

diffusion of C in, influence of Co, 9: 1869(J)

Carbon compounds

(See also Graphite compounds.)

labeled, bibliography, 9: 1488

from pile-neutron irradiation of ammonium sulfate, 9: 4404(J)

Carbon crucibles

preparation and properties of Ti, Zr, V, Nb, Ta, and W, for molten Ti, 9: 2247

Carbon dioxide–carbon monoxide systems

effects on heat treatment of Cr and Ni steels, 9: 7784

Carbon dioxide–helium systems

mutual solubility of gases at high temperatures in, 9: 3239(J)

Carbon dioxide–methane systems

viscosity of, at 25°C, 9: 3213

Carbon dioxides

absorption in spray columns, 9: 7692

absorption of, by sodium carbonate solutions, kinetics, 9: 1791(J)

activated adsorption on pyrolytic nickelous oxide, 9: 65

adsorption of, on porous glass barriers, 9: 7022

constant-pressure specific heat, at elevated temperatures and pressures, 9: 4061

effects of, on radiation injuries in seed of barley, 9: 2593(J)

energy required to produce one ion pair, 9: 5702(J)

excretion of, in animals, apparatus for tracer studies, 9: 7653

fixation of, by Rhodopseudomonas capsulatus, 9: 506

fixation of, by Rhodopseudomonas capsulatus in light and dark, 9: 61(R)

gas chromatographic elution of gases and volatile liquids from alumina, silica gel, or charcoal by, 9: 2672(J)

heat and free energy of formation, 9: 529(J)

ion pair formation, 9: 4039(R)

ionization by α particles and fission fragments, 9: 2821

mass spectra of C^{13}–or O^{18}–labeled, theory, 9: 5999(J)

mass spectra of O^{18}-labeled, 9: 5998(J)

measurement, capillary trap for, 9: 6908(J)

modifications in analysis of $C^{14}O_2$ by proportional counting, 9: 4857(J)

oxygen transfer between CO and, in presence of different carbons from 650 to 900°C, 9: 526(J)

photoionization efficiencies and cross sections in, 9: 6747(J)

Carbon dioxides (cont'd)

radiation-induced decomposition, 9: 4960(J)

reaction with graphite at high temperatures, 9: 6214(J), 6215(J), 6216(J)

separation of, from human breath, equipment, 9: 3940(J)

specific heat, thermal conductivity, and viscosity of, from 0 to 600°C, 9: 2822

stopping of deuterons in, 9: 5803(J)

sublimation of, in pressure-altitude measurements in the upper air, 9: 6707

thermodynamic functions of, to 12,000°K, 9: 1896

Carbon electrodes

lathe for turning spectrographic, 9: 7428

Carbon films

measurement of rates of formation, and optical properties, 9: 7712(J)

Carbon–iron–nickel systems

coefficient of self-diffusion of Fe in, 9: 5067(J)

equilibrium constant as a function of C content for, 9: 6279

phase studies, 9: 2317(J)

Carbon–iron–silicon systems

coefficient of self-diffusion of Fe in, 9: 5067(J)

Carbon–iron systems

diffusion of Fe in, 9: 7269(R)

equilibrium constant as a function of austenite composition, 9: 6279

interfacial and surface energies, 9: 6286(R)

preparation, microstructure, and phase studies, 9: 1265(R)

size of interstitial solute atoms, lattice expansion and electronic properties of close-packed, 9: 1780(J)

surface tension, 9: 2702(R)

Carbon isotopes

gas phase measurement of β particles from, 9: 2180(J)

Carbon isotopes C^{11}

production of, by 0.4- to 3.0-Bev proton bombardment of Al, cross sections for, 9: 6074(J)

yield from the reaction $B^{10}(p,\gamma)C^{11}$, 9: 7158(J)

Carbon isotopes C^{12}

alpha reactions with, energy levels of compound nucleus O^{16*} from, 9: 416(J)

bremsstrahlung reactions $(\gamma,3\alpha)$ at 330 Mev, excitation function, 9: 4294(J)

cross section for $(\gamma,3\alpha)$ reaction, 9: 6775(J)

deuteron reactions (d,d), 9: 1066(R)

deuteron reactions (d,γ), energy and intensity of γ rays from, 9: 370(J)

deuteron reactions (d,p), angular distribution of protons from, 9: 394(J)

deuteron reactions (d,p), at 3.29 Mev, proton polarization in, 9: 1647(J)

deuteron reactions (d,p) identification of proton groups from, 9: 794(J)

elastic phase scattering of neutrons between 1.9 and 3.8 Mev, 9: 1386(J)

elastic scattering angular distribution of fast neutrons, 9: 4596(J)

electric monopole transitions in, 9: 5479(J)

electromagnetic separation, 9: 2839

energy levels, 9: 761(J), 1393(J), 4876(J)

energy levels of, from B^{11} (d,n) reaction, 9: 6491(J)

gamma rays from 14-Mev neutron bombardment, 9: 3650(J)

gamma rays from inelastic scattering of 14-Mev neutrons on, 9: 6776(J)

gamma reaction (γ,α) cross sections, 9: 6484

gamma reactions $(\gamma,3\alpha)$ and energy levels, 9: 3656(J)

gamma reactions $(\gamma,3\alpha)$, yield of stars from, 9: 760

gamma reactions (γ,n), absolute cross section from 18 to 260 Mev, 9: 4292(J)

gamma reactions (γ,n), chemical effects in Na_2CO_3, 9: 5288(J)

Carbon isotopes C^{13} (cont'd)
gamma reactions (γ,p) and (γ,n), yield ratios, 9: 3300(J)
gamma spectrum from bombardment by deuterons, 9: 5505(J)
independent-particle state of, at high excitation, 9: 3299(J)
meson scattering by, optical model study of, 9: 4604(J)
neutron reactions (n,n'3α) at 12 to 20 Mev cross sections, 9: 7549(J)
nitrogen nucleus reactions (N^{14},2p), (N^{14},α), and (N^{14},2α), excitation functions for, 9: 1648(J)
proton inelastic scattering by, angular distribution of γ rays from, 9: 2455(J)
proton reactions (p,α), energy levels of B^{9} from, 9: 5506(J)
proton reactions (p,αp), mechanism of, at 32 Mev, 9: 1645, 7546(J)
proton reactions (p,γ), high-energy γ line from, 9: 767(J)
range-energy relations, 9: 408(J)
scattering of high-energy electrons by, and structure of, 9: 7519(J)
scattering of 340-Mev protons by subshells in, 9: 2444(J)
triton reactions, 9: 5154(J)
Carbon isotopes C^{13}
alpha reactions (α,n), 9: 382(J)
angular correlation and multipolarity of electron pairs from, 9: 2010(J)
bombardment of aluminum with, Cl^{35}/Cl^{34} ratio from, 9: 6081(J)
determination of, in wood samples, 9: 7031(J)
deuteron reactions (d,γ), γ spectra from, 9: 4289(J)
deuteron reactions (d,n), angular distributions, 9: 4875(J)
deuteron reactions (d,n), neutron spectra and angular distributions of, 9: 7114(J)
deuteron reactions (d,p), 9: 1393(J)
effect in thermodecomposition of ethyl bromide from 350 to 450°C, 9: 2143
energy levels, 9: 3998(J)
gamma spectrum from bombardment by deuterons, 9: 5505(J)
intermediate coupling, 9: 3625(J)
nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)
nuclear spin and gyromagnetic ratio, 9: 361(J)
photoneutron production, 9: 2518(J)
proton reactions (p,γ), 9: 764(J), 1067(R)
Carbon isotopes C^{14}
activity counting on paper chromatograms, scintillation counter design, 9: 4705(R)
age determination of geological samples by, 9: 3472(J)
age determinations and dating by, recent advances in, 9: 1000(J)
age determinations of specific geological and archeological samples by, 9: 1286(J)
angular distribution of γ rays and neutrons from proton bombardment of, 9: 6763(J)
beta spectra, 9: 1124(J), 1994(R), 2506(J)
beta spectra, measurement, 9: 437(J)
biosynthesis of albumin, atropine, chlorophyll, and glucose labeled with, 9: 2105(J)
carbohydrate metabolism of animals studied by, 9: 7664(J)
carbon distribution in organic substances formed by photosynthesis studied by, 9: 7658(J)
chloroplasts in biochemical functions of plant cells studied by, 9: 7656(J)
compounds labeled with, bibliography, 9: 1486
dating by, isolation of organic carbon from bones for, 9: 3473(J)
dating equipment using, improved design, 9: 1620(J)
dating of, with proportional counter filled with CO_2, 9: 3593(J)
dating with, liquid scintillation techniques for, 9: 7877(J)
decay, 9: 6530(J)
Carbon isotopes C^{14} (cont'd)
detection and measurement of, in dating archeological specimens of wood, 9: 4758(J)
detection and measurement of, in human breath, performance of ionization chamber, 9: 3940(J)
determination of, applied to dating of samples of charcoal, 9: 2347(J)
determination of, in G-M counter, 9: 7073(J)
determination of, in wood samples, 9: 7031(J)
deuteron reactions (d,p), 9: 1350(J)
diffusion in steel, 9: 4203(J)
energy levels, 9: 1350(J), 1393(J), 5154(J)
intramolecular isotope effects of C^{13} and, in the decarboxylation of malonic acid at 140.5°, 9: 871(J)
mean life of, relation to mean life of excited state of nitrogen, 9: 6453(J)
measurements of activity of, comparison of sensitivities of, 9: 6513(J)
metabolic rate of yeast and lactic acid bacteria studied by, 9: 7662(J)
methods of measurement of, and excretion of glucose studied by, 9: 6593(J)
modifications in a proportional counter for the radiometric determination of, 9: 4857(J)
natural, scintillation techniques for detection of, 9: 6113(J)
physiology of plant fruits studied by, 9: 7661(J)
preparation of samples of, and dosage measurement, 9: 6721(J)
primary photosynthesis products studied by, 9: 7657(J)
proton reactions (p,γ) 9: 7386
proton reactions (p,γ), resonances in, 9: 1092(J)
quantitative radiographic determination of β particles from, in single cells, 9: 1734(J)
radioassay of compounds labeled with, accuracy, 9: 6197(J)
radiometric determination of, application of high-frequency induction furnace to, 9: 1476
radiometric determination of, in products formed by dissolution of neutron-irradiated ammonium bromide in water, 9: 900(J)
radiometric determination of, liquid scintillation counter for, 9: 701
simultaneous combustion determination of total C and, 9: 4728(J)
trace amounts of, radiometric determination, 9: 6008(J)
as trace element in clinical studies, 9: 3748(R)
tracer use in study of the Dieckmann condensation of diethyl phenylenediacetate, 9: 6632(J)
Carbon isotopes C^{15}
nuclear properties, 9: 1350(J)
Carbon–manganese–titanium systems
fabrication, heat treatment, phase studies, mechanical properties, microstructure, and aging characteristics, 9: 1856
heat treatment, mechanical properties, microstructure, and phase studies, 9: 180(R)
phase studies and microstructure, 9: 1873(J)
Carbon–molybdenum–silicon systems
phase diagrams, 9: 4704
Carbon–molybdenum–titanium systems
forging in inert gas, 9: 984(J)
grain growth and size, microstructure, phase studies, and tensile properties of heat-treated, 9: 975
phase studies and preparation, 9: 5359
Carbon–molybdenum–tungsten systems
phase studies and preparation, 9: 5359
Carbon monoxide–carbon dioxide systems
effect on heat treatment of Cr and Ni steels, 9: 7784
Carbon monoxides
activated adsorption on pyrolytic nickelous oxide, 9: 65
adsorption on Ni surfaces, 9: 7684(J)

Carbon monoxides (cont'd)

adsorption on Ni surfaces at high temperatures, 9: 7685(J)

atomic polarizations and dipole moments of, theory, 9: 2888(J)

electron collision cross-section determination with electron spectrometer, 9: 3696

heat and free energy of formation, 9: 529(J)

interaction with clean metal surfaces, 9: 2159(J)

kinetics of reaction with nitric acid, 9: 3051

microwave spectra of C^{13}- and O^{18}-labeled, 9: 6437(R)

oxygen transfer between CO_2 and, in presence of different carbons from 650 to 900°C, 9: 526(J)

predissociations of $C^{12}O$ and $C^{13}O$, 9: 3389(J)

protection of animal organisms against radiation damage by, 9: 7637(J)

radiation protection, 9: 2599(J)

reactions with H^3, effect of β radiation on, 9: 6940(J)

thermodynamic functions of, to 12,000°K, 9: 1896

yield from decomposition of methanol by Co^{60} gamma radiation and 28-Mev He ions, 9: 2202(J)

Carbon–nickel–titanium systems

microstructure and phase studies, 9: 3457

Carbon–niobium–silicon systems

phase diagrams, 9: 4704

Carbon–oxygen–titanium systems

mechanical properties, microstructure, and phase studies, 9: 1870

Carbon–silicon–tantalum systems

phase diagrams, 9: 4704

Carbon–silicon–titanium systems

constitution diagrams, 9: 4187, 4704

Carbon–silicon–tungsten systems

phase diagrams, 9: 4704

Carbon–silicon–zirconium systems

phase diagrams, 9: 4704

Carbon steel

behavior in bicarbonate solutions, 9: 6648(J)

blistering and embrittlement of pressure vessel, by H, 9: 1887

brazing of, with B–Ni–Cr systems, 9: 1886

corrosion by liquid Na on, 9: 5647(J)

corrosion in water and aqueous media at 600 and 680°F, 9: 1822

corrosion of, by wet and dry Cl_2 between 260 and 300°, 9: 158(J)

corrosion of, in acid medium, inhibitory effect of Sapamin CH, 9: 156(J)

corrosion of, inhibition by pertechnetate ion, 9: 1825

electrical and thermal conductivities of AISI C-1010, 9: 1502

embrittlement of chromized coating on, at 475°C, 9: 7812(J)

graphitization of martensitic microstructure in, at 1200°F, 9: 6671(J)

spheroidize annealing, 9: 194(J)

stress values of, chart and nomograph for, 9: 3441(J)

tensile properties of welds of, over temperature range −300 to 1400°F, 9: 223(J)

tensile strength of speroidize annealed, 9: 194(J)

welding heavy section of, techniques and requirements for, 9: 222(J)

Carbon tetrachloride

isotopic exchange between PCl_3 and CCl_4, 9: 4373(J)

mixtures with 3-methylheptane, total pressure from 25 to 80°C, 9: 1751(J)

neutron transmission, 9: 3965(R)

Carbon tetrachloride–benzene systems

effects of radiation on, with indicator sensitizer solutions, 9: 2647(R)

Carbon tetrachloride–boron chloride systems

interdiffusion coefficients in gaseous systems at 30°C, 9: 4937(J)

Carbon tetrachloride–boron fluoride systems

interdiffusion coefficients in gaseous systems at 30°C, 9: 4937(J)

Carbon tetrafluoride

heat of formation, 9: 1774(J)

heat of formation, measurement of, from combustion colorimetry of polytetrafluoroethylene, 9: 1775(J)

infrared spectrophotometry, analysis of small samples by, 9: 7697(J)

Carbon–titanium systems

mechanical properties, microstructure, and phase studies, 9: 1870(J)

mechanical properties of welded, 9: 1859(R)

microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296

phase studies, vacuum annealing, machinery, and combustion determination of C in, 9: 1859(R)

preparation, double inert-gas arc melting, forging, and welding, 9: 3489(R)

preparation by nonconsumable and consumable electrode arc melting, 9: 2293(R)

room-temperature dynamic elastic modulus and its ratio to density, 9: 2728(R)

size of interstitial solute atoms, lattice expansion, and electronic properties of close packed, 9: 1780(J)

tensile properties in the temperature range -196 to 515°C, 9: 5667

Carbon–uranium sandstone deposits (Ind.)

occurrence in coal field, 9: 1515

Carbon–uranium sandstone deposits (S. Dak.)

occurrence in Harding Co., 9: 7758

Carbon–uranium sandstone deposits (U.S.)

occurrence and prospecting, 9: 5326(R)

Carbon–uranium sandstone deposits (Utah)

occurrence in Southern Utah, 9: 3466(J)

Carbon–uranium systems

thermal conductivity at 70°C, 9: 1879(J)

Carbonaceous rocks

design and calibration of an automatic micromuffle for determination of ash in, 9: 3398(J)

Carbonaceous shale deposits (Ind.)

exploration of, 9: 1515

Carbonaceous shale deposits (Idaho)

occurrence, 9: 2263

Carbonaceous shale deposits (W. Va.)

occurrence of radioactive, of Pennsylvanian and Permian age in northern W. Va., 9: 6268

Carbonaceous shale deposits (Wyo.)

occurrence, 9: 2263

Carbonaceous shales

(See also Black shales.)

retention of U during oxidative ashing of, 9: 881

Carbonate complexes

absence of isotopic exchange in the carbonate ion and carbonato-tetrammino-cobalt complex, 9: 6939(J)

Carbonate ions

absence of isotopic exchange in, and carbonato-tetrammino-cobalt complex ion reaction, 9: 6939(J)

Carbonate leach solutions

(See Uranium leach solutions (carbonate).)

Carbonates

(See also carbonates of specific elements; see also Uranyl carbonate)

behavior of iron and carbon steels in solutions of, 9: 6648(J)

incorporation of, into normal and x irradiated chick embryos, tracer study, 9: 3376

metabolic, tissue distribution, tracer study, 9: 5929(J)

Carbondale Formation (Ill.)

geology and radioactivity of coal and shale deposits in, 9: 6653

Carbonyl chloride
(See Phosgene.)
Carbonyl chloride fluoride
thermodynamic properties, 9: 1769(J)
Carbonyl compounds
fundamental vibrations of molecules of type X_2CO, 9: 917(J)
Carbonyl fluoride
force constants and thermodynamic properties, 9: 1769(J)
Carbonyls
(See also specific carbonyls.)
chromatographic determination of, 9: 7232(R)
chromatographic separation, 9: 5571
colorimetric determination, 9: 5571
fundamental vibrations of molecules of type X_2CO, 9: 917(J)
preparation of cyclopentadienyl-carbon monoxide compounds from metal, 9: 6937(J)
Carcinogens
radioactive and chemical, effects of, on mice, 9: 2565(J)
Carcinomas
(See also specific carcinomas, organs, tissues, animals, etc. see also subheadings under specific radiations.)
cervical, radiotherapy using Co^{60}, applicator, 9: 4053(J)
cervical, radiotherapy using Co^{60}, dosimetry, 9: 4052(J)
of cervix uteri, radiotherapy combining Au^{198} with radium, dosimetry, 9: 5872(J)
effects of 180-kev and 31-Mev x radiation on Ehrlich-Ascites, of white mice, 9: 7629(J)
effusions associated with, therapy with colloidal Au^{198}, 9: 1175(J)
mouse mammary growth following transplantation, effects of preirradiation of the tumor bed, 9: 4353(J)
nucleic acid content of, effects of radiation on cellular suspensions, 9: 1718(J)
of prostate, treatment with Au^{198}, 9: 4680(J)
therapy of, of ovaries, pleura, and peritoneum with radioactive gold, 9: 1162(J)
therapy of bronchial, with radioactive cobalt, 9: 1163(J)
of thyroid gland, uptake of I^{131} by, evaluation, 9: 4685(J)
Cardiography
effects of total-body irradiation on results of, in hamsters, 9: 489(J)
instrument for time derivative of acceleration measurements, 9: 5703
Carlisle Quadrangle (Utah)
photogeologic map of, 9: 2269(J), 3832(J), 6975(J), 6976(J), 6977(J), 6978(J), 6979(J), 6980(J), 6981(J), 6982(J), 6983(J), 6984(J)
Carmel Formation (Colo.)
geology of, in Horse Range Mesa Quadrangle, 9: 7775(J)
Carnegie Inst. of Tech., Pittsburgh
progress reports on lattice imperfections and grain boundaries, 9: 971(R)
progress reports on luminescent efficiency of large crystals of $CaWO_4$ and $CdWO_4$, 9: 232(R)
progress reports on radiation effects in solids, 9: 800(R)
progress reports on thermal and electrical properties of solids at low temperature, 9: 5077
Carnegie Inst. of Tech., Pittsburgh. Metals Research Lab.
progress reports on electrochemical studies of non-aqueous melts, 9: 1467(R), 2135(R), 4437(R), 7269(R)
progress reports on free energy change of austenite-pearlite systems, 9: 6386(R)
Carnegie Institution of Washington, D. C.
progress reports on alignment of Ce^{141} and Nd^{147} nuclei, 9: 354(R)
Carnotites
cloud chamber tracks from samples of, 9: 7578(J)
occurrence in Delta deposit (Utah), 9: 4998
Carotenoids
action mechanisms and connection with metabolism of sulfur-containing amino acids, 9: 7665(J)
function of, in photosynthesis, 9: 5835
Carrizo Mountains (Ariz.—N. Mex.—Utah)
sedimentary trends in, 9: 2262(R)
Carthage Area (N. Mex.)
geophysical exploration, 9: 2709
Cascade impactors
for the collection of aerosol samples for determinations of α activity, design, 9: 6686
Cascade showers
(See also showers identified by the inducing radiation, e.g., Cosmic showers.)
electron-photon, fluctuation of number of photons in, 9: 5687(J)
electron-photon, of energy spectrum at 3500 m in Pb, 9: 259(J)
electron-photon, produced in Cu by electrons, analysis, 9: 7051(J)
electro-photon, scintillation counter study of energy spectra at 11,200 ft, 9: 4221(J)
energy estimation of, from neutral π meson decay, 9: 2360
integral equations for, 9: 1692(J)
latitude effect on nucleonic component, 9: 4491(J)
new formulation of general three-dimensional theory of, 9: 1693(J)
penetrating, produced in Pb and C at 11,200 ft, detection and analysis with plastic scintillation counters, 9: 1929(J)
produced by high energy π meson, mean free path for, 9: 1925(J)
production of, in paraffin, graphite, iron, and lead by fast nucleons from cosmic radiation, 9: 2814(J)
theory, use of concept of sets enchained by a stochastic process in, 9: 1688
theory of, age-dependent branching stochastic processes in, 9: 813(J)
Case Inst. of Tech., Cleveland
progress reports on an investigation of overcoming rheotropic embrittlement in Ti and Ti-base alloys, 9: 1848(R)
progress reports on high-temperature scaling behavior of Zr, 9: 3458(R)
progress reports on high temperature scaling of metals and alloys, 9: 6261(R)
progress reports on scaling of Zr at elevated temperatures, 9: 967(R), 7754
Caseyville Sandstone (Ill.)
geology and radioactivity of coal and shale deposits in, 9: 6653
Cast iron
mechanical properties and resistance to cavitation corrosion in fresh water and sea water, 9: 3148(J)
microstructure, examination of under varying stress, test equipment for, 9: 5971(J)
polishing of, with alumina abrasives, technique, 9: 3879(J)
spheroidal graphite formation in, 9: 206(J)
Castings
from high-vacuum melts, 9: 195(J)
Catalases
effects of radiation on, protective effects of cysteine, cystine, and glutathione, 9: 2199(J)
luminescence of, under high-energy γ irradiation before and after 50 kv x irradiation, 9: 1783
Catalysis
(See also appropriate subheadings under specific chemical processes.)
fundamental studies of, application of infrared spectroscopy to, 9: 50
isotopic methods in investigation of, 9: 7321(J)
Catalysts
(See also specific catalysts identified by material; see also Catalases; Catalysis; Enzymes.)
adsorptive properties, 9: 50

Cataracts

radioinduced, by exposure to β particles of eyes of man and rabbits, 9: 2118(J)

radioinduced, conference on, 9: 3722, 3723, 3724, 3725

radioinduced, in rabbits, 9: 7623(J)

radioinduced, mechanisms of production in rabbits, 9: 494(J)

radioinduced by exposure to fast neutrons and x radiation, 9: 7245(J)

Cathode rays

(See also Electrons.)

effects of exposure to, in producing skin erythema, 9: 1158(J)

Cathodes

(See also Electrodes; Electron tubes; Mercury cathodes.)

electron emission, 9: 3251(R)

materials, 9: 1893(R)

multi-alkali, for photomultiplier tubes, properties of, 9: 6372(R)

for photomultiplier tubes, properties, 9: 7427(R)

secondary electron emission, 9: 3208(R)

Cation exchange materials

neutralization titration of, in anhydrous pyridine, 9: 882(J)

preparation and properties of disks of, 9: 913(J)

selectivities of, by osmotic behavior, 9: 3101(J)

Cations

hydration in polystyrene sulfonates, 9: 3392(J)

inorganic, chromatographic separation of, 9: 1483(J)

Catskill Formation (Penna.)

geology and U distribution, 9: 164(J)

Cattle

radioactivity of thyroid gland of, 9: 7249(R)

Cave Hills Area (S. Dak.)

geologic map of, 9: 5333(J)

uranium distribution, geology, 9: 7758

Caves

design, 9: 7306

design of, for solid-state laboratory, 9: 574(J)

equipped for the preparation of γ-sources, design, 9: 572

equipped with modified dry box for remote chemical separations, 9: 570(J), 571(J)

for handling irradiated metallurgical samples, design, 9: 551(J), 553(J) 554(J)

for handling irradiated Ra^{226}, design, 9: 552(J)

for studies of physics and metallurgy of radioactive materials, 9: 578(J)

Cavity resonators

analysis of coupled, for π mode, 9: 3987

frequency measurement of, design of crystal-controlled oscillator for, 9: 7429

Cellulose

biosynthesis of C^{14}-labeled, from D-glucose-C^{14} in cotton bolls, 9: 7734(J)

biosynthesis of C^{14}-specifically labeled, from D-mannitol-1-C^{14} by Acetobacter xylinum, 9: 125(J)

Cements

(See also Adhesives; Concretes.)

corrosion resistance and applications of construction, survey and directory of, 9: 137(J)

properties and reactor applications, 9: 6476

Centrifugation

pre- and post-irradiation, effects on chromosomes of Tradescantia and Vicia, 9: 842(J)

Centrifuges

for use with molten salts and liquid metals at temperatures up to 500°C, design and performance, 9: 3789

Ceramic bodies

mechanical properties of, 9: 1820

Ceramic bonding

with metals, mechanism, 9: 5644(J)

Ceramic coatings

(See also Porcelain enamels.)

composition, preparation, properties, and testing of, for high-temperature alloy parts in nuclear reactors, 9: 2249(J)

development of high-emissivity, high-reflectivity, and oxidation resistant, for aircraft power plants, 9: 6645

effects on oxidation and impact strength of variously heat-treated Ti samples, 9: 3868

high-temperature resistant, development, 9: 4137(R)

permeability of base coat glasses to He, 9: 615

permeability of glass, to gases, factors affecting, 9: 616

preparation, 9: 5644(J)

refractory, thermal insulating properties of, at temperatures to 500°F, 9: 938

refractory properties, 9: 4137(R)

temperature-resistant, for use in nuclear reactors, 9: 1253(J)

on titanium, effects on mechanical properties and oxidation resistance, 9: 4461

Ceramic materials

(See also specific compounds and materials by common names. In indexing ceramic systems, the names of the constituents are arranged in alphabetic order, and one entry is made under the first name; e.g., the binary aluminate $BaO-Al_2O_3$ is indexed as aluminum oxide-barium oxide systems. See also Refractory materials.)

chemical properties, hardness, phase studies, and preparation, 9: 6280

corrosion in water and aqueous media at 600 and 680°F, 9: 1822

creep, effects of high temperature on, 9: 5358

dielectric measurements in 3 cm wavelength region, 9: 3962

electrical and mechanical properties, 9: 5644(J)

electrical properties, effects of pile radiation on, 9: 7722

industrial applications, physical and chemical properties, review, 9: 7329(J)

metallography, microstructure, and electromechanical properties, 9: 4993

oxides of Mn and Ni, resistivity of, 9: 5946(J)

resistance to thermal stresses, factors affecting, 9: 1505

thermal conductivity and x-ray diffraction patterns, effects of radiation, 9: 5382(R)

thermal conductivity for single phase, temperature dependence of, 9: 5645(J)

thermal fracture under quasi-static thermal stresses, 9: 1506(J)

thermal shock analysis of spherical, 9: 1497(J)

thermogravimetric analysis, apparatus for, 9: 5944

Ceramic–metal couples

production by pressed powder techniques, 9: 4138(R)

Ceramic–metal systems

(See Cermets.)

Ceramics

(See Ceramic materials.)

friction-tinning soldering technique for, 9: 7818(J)

Cerianites

discovery, analysis, and crystal structure, 9: 6654(J)

Cerites

separation of Th from, 9: 5892(J)

Cerium

absorption on clay as simulants for contaminants for nuclear detonations in harbors, 9: 658

1:1 compounds with Bi, preparation and crystal structure, 9: 5620(J)

Cerium (cont'd)
1:1 compounds with P, preparation and crystal structure, 9: 5619(J)
with cupferron, pyrolysis, 9: 5920(J)
determination by Cu-spark spectroscopy, 9: 885(J)
paramagnetic resonance absorption spectra, 9: 2075(J)
phase studies of between CeO_2 and Ce_2O_3, 9: 114(J)
preparation of carrier, by fractional precipitation and fractional distillation, 9: 3793
radiochemical determination, 9: 876
radiochemical determination in fission based on solvent extraction of Ce^{44} with methyl isobutyl ketone, 9: 2174(J)
radiometric determination, 9: 2634
spectrographic determination of, in ores and rocks, 9: 162
spectrophotometric determination, 9: 5605(J)
Cerium borides
reactions with C and N_2, equilibria studies, 9: 5677(J)
Cerium chelates
with 2,4-pentanedione, formation constants, enthalpy and entropy, 9: 3390(J)
with 8-quinolinol, precipitation of, 9: 83(J)
Cerium complexes
with citrate, spectrophotometric studies, 9: 4964(J)
properties of citrate, in aqueous and 50% alcohol solutions, 9: 3794
Cerium compounds
with cyclopentadiene, 9: 3096(J)
hydroxyfluoberyllates, preparation and properties, 9: 5900(J)
oxidation and reduction of, by ionizing radiation, 9: 1215(J)
preparation and structure of arsenides and antimonides, 9: 5293(J)
role of oxygen radicals in oxidations and reductions of cerous-ceric system caused by ionizing radiations, 9: 1214(J)
Cerium fluorides
equilibrium pressures, measurements, 9: 4705(R)
Cerium hydrides
preparation and properties of, 9: 2205(J)
Cerium hydroxides
precipitation of hydrates, pH and oxidation potential effects, 9: 4966(J)
removal of hydrogen peroxide from ethers by, 9: 4752(J)
Cerium ions
distribution of, between melts and solid phases, 9: 6554(R)
isotopic exchange of, between Ce^{3+} and Ce^{4+} in $HClO_4$, 9: 7726
radiation induced Ce(III)–Ce(IV) exchange in aqueous nitric and sulfuric acids, 9: 2668(J)
Cerium(III) ions
thermodynamic formation constants in aqueous solution for reaction of, with acetylacetonate at 30°C, 9: 1191(J)
Cerium(IV) ions
in perchloric acid solutions, preparation and standardization, 9: 5610(J)
photo-oxidation of water by, mechanism of, 9: 2669
reaction between formic acid and, in aqueous solutions due to x-ray irradiation, 9: 3792(J)
Cerium isotopes
fission yields of, from U^{233}, 9: 7982
Cerium isotopes Ce^{139}
decay scheme, 9: 1404(J)
Cerium isotopes Ce^{140}
excited states, relative γ intensities, and internal conversion coefficients, 9: 6047(J)
K-shell internal conversion coefficients and multipolarity assignments, 9: 5535(J)
spins and parities of excited states, 9: 4282(J)
Cerium isotopes Ce^{141}
disintegration, 9: 3339(J), 7111(J)
disintegration and decay schemes, 9: 802
nuclear alignment, γ spectra, and magnetic moments, 9: 354(R)
Cerium isotopes Ce^{144}
bone deposition of, in rats, 9: 7232(R)
gamma spectra, 9: 1402(J), 1403(J), 4333
Cerium–magnesium alloys
creep, 9: 5342(R)
creep behavior and microstructure, 9: 192
crystal structure, 9: 683(J)
grain boundaries, microscopy, 9: 4161(R)
Cerium–nickel alloys
crystal structure, 9: 683(J)
Cerium nitrides
preparation and structure, 9: 5292(J)
Cerium oxide–uranium oxide systems
crystal structure and electric conductivity, 9: 7277(J)
phase studies and crystal structure, 9: 7278(J)
Cerium oxides
(See also Cerianites.)
ordered intermediate phases in ceric oxide–cerous oxide systems, 9: 3426(J)
formation of $Ce_2O_3 \cdot 2ZrO_2$ in system $BaCl_2$–$CeCl_3$–$BaZrO_3$, 9: 4408(J)
Cerium perchlorates
ultraviolet absorption spectra of aqueous solutions of, 9: 4406(J)
Cerium silicides
reactions with C and N_2 at 2000°K, 9: 4704
Cerium sulfates
crystal structure, 9: 1011(J)
Cerium sulfides
properties of, effect of molten Ti on, 9: 2248
Cermet–metal couples
reaction products of, x-ray diffraction identification, hot pressing, and thermodynamic properties, 9: 6056(R)
Cermets
(Specific cermets are indexed as Systems, the names of the constituents being arranged both in alphabetical and inverted orders.)
bonding, preparation and properties, 9: 5644(J)
impact and stress-rupture testing of TiC base, 9: 4991(R)
impact strength test equipment, 9: 4140
metallurgical properties, survey, 9: 3822(J)
powder metallurgy of, review, 9: 198(J)
Cerrillos Mining District (N. Mex.)
mineralogy and exploration of, 9: 955(J)
Cesium
adsorption of, in low concentrations by filter paper, 9: 4714(J)
K absorption frequency, 9: 3698(J)
radiochemical determination, 9: 876, 2634
reaction with $BF_3 \cdot NH_3$, 9: 515
thermodynamic properties, 9: 7282(J)
uptake and translocation of, by plants, tracer study, 9: 3752
Cesium–antimony alloys
crystal structure, 9: 1893(R)
Cesium bromides
absorption spectra of irradiated, 9: 6868
fluorescence and thermoluminescence in x-irradiated crystals of, 9: 3682(J)

Cesium bromides (cont'd)

solid and liquid, molar volume and structure, 9: 4933(J)

Cesium–cesium halide systems

phase studies, 9: 3771(J)

Cesium chlorides

diffusion coefficients for aqueous solutions of, at 25°C, 9: 109(J)

solid and liquid, molar volume, 9: 4933(J)

Cesium chloroantimonites

crystal structure, 9: 93(J)

Cesium chloroferrites

crystal structure, 9: 93(J)

Cesium fluoride crystals

luminescence of unactivated and Tl-activated, effects of α, γ and ultraviolet radiations on, 9: 5109

Cesium–graphite compounds

formation of, 9: 5906(J)

Cesium halide–cesium systems

phase studies, 9: 3771(J)

Cesium halides

solid and liquid, molar volume and structure, 9: 4933(J)

Cesium iodides

crystal structure, 9: 2375(J)

lattice constants, 9: 3408

solid and liquid, molar volume and structure, 9: 4933(J)

Cesium ions

elution behavior of, from sulfonic acid resins, 9: 5298(J)

ion-exchange equilibria on Dowex 50 resins, 9: 6623(J)

separation by ion exchange, 9: 910(J)

Cesium isotopes

fission product, absorption in soils, 9: 5837

Cesium isotopes Cs^{125}

decay schemes, 9: 735

Cesium isotopes Cs^{126}

decay scheme, 9: 803(J)

Cesium isotopes Cs^{127}

decay schemes, 9: 735

Cesium isotopes Cs^{128}

decay schemes of Ba^{128}–Cs^{128} decay chain, 9: 2136(R)

Cesium isotopes Cs^{131}

decay, K and L x-ray intensities in, 9: 5536(J)

decay scheme and uses in implant therapy, 9: 3748(R)

preparation of carrier-free, 9: 1190(J)

x-ray spectra, 9: 4101(R)

Cesium isotopes Cs^{132}

radioactivity, 9: 4101(R)

Cesium isotopes Cs^{133}

energy levels, spacings and neutron widths of, 9: 6045(J)

Cesium isotopes Cs^{134}

decay, 9: 4630(J)

decay scheme of Cs^{134m} and, 9: 2507(J)

gamma-ray energies in decay of, 9: 1123(J)

hyperfine splitting and sign of magnetic moment of 3.1-hr metastable state of, 9: 2005(J)

nuclear hyperfine structure interaction in 3.1-hr metastable state of, 9: 2006(J)

nuclear spin and magnetic moment, 9: 6058(J)

spin and nuclear magnetic moment, 9: 988(R)

Cesium isotopes Cs^{137}

beta decay, 9: 7579(J)

Cesium isotopes Cs^{137} (cont'd)

half life, 9: 6127(J)

phosphotungstate precipitation method of analysis of, in solutions of long lived fission product activities, 9: 879

protection against radiation from, handbook, 9: 1452(J)

use in teletherapy device, 9: 6849

Cesium isotopes Cs^{138}

decay schemes, measurements and interpretation, 9: 3332(J)

Ceylon

gadolinium minerals distribution in, 9: 7335

Chadron Formation (S. Dak.)

geology, 9: 7758

geology and U distribution, 9: 3158(J)

Chalk Mountain Mine (Nev.)

uranium occurrence, 9: 6963

Chandalar District (Alaska)

exploration and geology, 9: 628(J)

Charcoal

(See also Carbon (activated).)

adsorptive properties of, for radon, 9: 6099(J)

gas chromatographic elution of gases and volatile liquids from H_2, N_2, or CO_2, 9: 2672(J)

heats of adsorption of N on, 9: 1789

radiocarbon dating of samples of, 9: 2347(J)

Charged particles

acceleration of moving, by means of a magnetized medium, 9: 455(J), 7030(J)

analysis of properties of, in nuclear emulsions as functions of velocity, 9: 304

in constant electromagnetic fields, avoiding of infrared divergencies in radiative effects of, 9: 464(J)

density effect in ionization energy loss of, 9: 7179(J)

diffusion and absorption in radial electric fields with absorber, 9: 3676(J)

distribution function of energy losses of, undergoing multiple collisions, 9: 7582(J)

elastic scattering by nuclei, generalized formula, 9: 3667

energy loss by ionization, derivation of distributions, 9: 4003(J)

focusing by TM_{01} waves, 9: 726

focusing by uniform magnetic field, 9: 2804(J)

focusing theory, 9: 988(R)

identification with 2 scintillation crystals, 9: 5443(J)

inelastic scattering of in synchrotrons, 9: 6091(J)

interaction with electromagnetic fields, theory, 9: 4025

interaction with quantum fields, theory, 9: 4906(J)

mass determination of, in nuclear emulsions, 9: 322(J)

motion in crossed electric and magnetic fields, equations, 9: 4246

multiple Coulomb scattering from extended nuclei, 9: 775

multiple scattering through small angles, theory, 9: 3996(J)

passage through plasma, 9: 5696(J)

penetration of heavy, review in Annual Review of Nuclear Science,

potential energy of, in anisotropic medium, 9: 4892(J)

potentials and fields due to bounded array of, 9: 7823

range determination from change in ionization in cloud chamber, 9: 4205(R)

range straggling in nuclear emulsions, theory, 9: 4594(J)

scattering, correction for, in counter experiments, 9: 1117(J)

scattering constant for, in nuclear emulsions, 9: 4303(J)

single scattering by shielded coulomb field, theory, 9: 3668(J)

Charged particles (cont'd)
tracks in nuclear emulsions, characteristics, 9: 5436(J)
tracks in nuclear emulsions, tables for analysis of, 9: 4245
trajectories in electrostatic fields, graph-analytical methods for determining, 9: 3229(J)
trajectory of, in the magnetic field with axial symmetry of a β-spectrometer, calculation, 9: 5118
Charles No. 2 Claim (Utah)
mineralogy, 9: 1829
Chattanooga Shale (Tenn.)
exploration and analysis for U, 9: 4997(R)
Chelates
(See also compounds used as chelation agents; see also main headings by name of metal chelated.)
chemical properties, formation, and excretory effects, 9: 1739
chemical properties and preparation, 9: 512
spectra of copper chelates with diketones, effect of F substitution on, 9: 6219
Chelation
of ethylenediaminetetraacetic acid with uranyl ion, 9: 3436(J)
Chemical analysis
(See also specific methods of analysis; see also appropriate subheadings under specific materials.)
by gamma spectroscopy, 9: 7449
isotopic dilution technique for, 9: 3783(J)
Chemical corrosion
(See Electrochemical corrosion.)
Chemical engineering
symposium on mineral engineering techniques, 9: 4982(J)
use of computers in, 9: 3387(J)
Chemical radiation detectors
(See also Radiation detection instruments (colorimetric))
calibration of cobalt glass and Ag-activated phosphate glass dosimeters, 9: 3932
conductimetric and colorimetric, performance, 9: 4242(R)
containing sensitized KBr crystals, performance as γ dosimeter, 9: 3922, 4243
decomposition of oxalic acid by γ radiation, possible use as dosimeter, 9: 6929(J)
gamma dosimetry with ferric orthophenanthrolene, 9: 3267(J)
halogenated hydrocarbon, for x and γ radiation, 9: 5548(P)
investigation of acrylonitriles, benzene–CCl_4 systems, and halogenated plastics as, 9: 2847(R)
performance, 9: 899
performance, for dosimetry of γ radiation and fast neutrons, 9: 700
performance of phosphate glass containing Co for, 9: 1040
properties of $FeSO_4$–Li_2SO_4, for fast neutrons and ionizing radiation, 9: 6106(J)
radiolysis of solutions of dithizone and methyl yellow applied as, 9: 4751(J)
radiosensitivity of chloroform and tetrachloroethylene as, 9: 4241(R)
radiosensitivity of solutions of 2-hydroxy-4-nitrophenylazo-β-naphthol and of diazoresorcinol used as, 9: 5290(J)
response to high energy radiation, 9: 2657(R)
utilizing acrylonitrile or CCl_4–benzene–indicator–sensitizer systems, 9: 2848(R)
Chemical warfare agents
(See also specific agents.)
removal from water supplies by ion-exchange materials, 9: 914
Chemicals and reagents
(See also specific chemicals and reagents.)
Chemicals and reagents (cont'd)
effects of high-energy radiation on, tested as chemical radiation detectors, 9: 2657(R)
preparation of, Arco Chemical Plant manual for, 9: 6604
Cherenkov detectors
characteristics and design of, review, 9: 3943(J)
cosmic-ray α particle measurements with, 9: 255
design of, for selection of slow particles, 9: 1607(J)
lead-glass plates as, possibility of use of, 9: 1962
properties of nonfocused, 9: 3590(J)
with thin lucite radiators, flux measurements on cosmic-ray α particles with, 9: 5738(J)
Cherenkov radiation
by cosmic particles in atmosphere, 9: 1920
for detection of single μ mesons in air, 9: 6427(J)
emission by electron beams, 9: 3568(J)
emission by particle traversing magnetic material, theory, 9: 2043(J)
from $\pi^{\pm}$ mesons, measurement, 9: 5429(J)
review, theory, and applications of, 9: 6510(J)
Chicago. Univ.
progress reports on hydrides and borohydrides, 9: 7266(R)
Chicago. Univ. Air Force Radiation Lab.
progress reports, 9: 4665
progress reports on biological research, 9: 480(R), 2548(R), 6154(R)
Chichagof Area (Alaska)
geology, mineralogy, and exploration, 9: 6967(J)
Chickens
blood volume determinations for roosters and chicks, 9: 6820(R)
embryos, LD_{50} determinations, 9: 822(J)
renal function, radiosensitivity, 9: 3(R)
survival after fast neutron and γ ray exposure, effects of dose rates, 9: 6840(J)
China clay
(See Kaolins.)
Chinle Formation (Ariz.)
exploration and geology, 9: 1828
Chinle Formation (Colo.)
geology of, in Horse Range Mesa Quadrangle, 9: 7775(J)
Chinle Formation (Utah)
exploration and stratigraphy, 9: 1256
geochemical study of stratigraphic section of, 9: 5047(J)
stratigraphy of, in Seven Mile Canyon Area, 9: 6964
Chisana District (Alaska)
geology, 9: 628(J)
Chloral
polarographic determination, 9: 539(J)
Chloride complexes
semiempirical study of H_2Cl, through H isotope effects, 9: 6894(J)
with U^{4+}, stability at various temperatures, 9: 5629(J)
Chloride ions
activity measurements NaCl, KCl, and $MgCl_2$ solutions with resin membrane electrodes, 9: 2150(J)
adsorption on quartz, 9: 3111(R)
conductometric determination in alkali metals by paper chromatography, design and performance of apparatus for, 9: 2215(J)
corrosion of HNO_3 recovery system due to, 9: 5623
Chlorides
chemical effect of, on normal and stainless steel, 9: 6648(J)
exchange of chlorine between $PtCl_4^{2-}$ and, 9: 7258
Chlorides (liquid)
electric conductivity, 9: 2139(J)

Chlorination
of benzene under γ radiation, equipment for design, 9: 1550(R)

Chlorine
adsorption by charcoal from a stream of air, 9: 4411
adsorption on graphite, 9: 5906(J)
bombardment by N ions, activities produced from, 9: 5801(J)
charge accumulation due to Auger effect, 9: 7886(J)
chemical determination in UF_4, 9: 4385
corrosive effects of, on Al, C steel, Cu, stainless steel, and Ni between 260 and 300°, 9: 158(J)
exchange of, between Cl^- and $PtCl_4^{2-}$, 9: 7258
exchange of, between Cl^- and $[PtCl_4]^{2-}$ ions, 9: 5253(J)
mass spectrometric study of natural and neutron irradiated, 9: 2499(J)
neutron cross sections, 9: 3965(R)
neutron total cross sections, 9: 7124(J)
nuclear quadrupole coupling, 9: 1340(J)
proton total cross sections at 208 and 315 Mev, 9: 358(J)
radiochemical determination, 9: 876
semimicro determination in organic compounds, 9: 2166(J)

Chlorine fluoride–hydrofluoric acid systems
solid-liquid equilibria, electrical conductivities, and vapor pressures, 9: 4741

Chlorine fluorides
adsorption of ClF_3 on porous NiF_2, 9: 6919(J)
fluorination of NiO powders by, kinetics, 9: 6608(J)
infrared band of a molecular complex between hydrogen fluoride and, 9: 896(J)
magnetic susceptibilities, 9: 4741
toxicology studies of, 9: 47

Chlorine ions
charge distribution from A^{37} K capture, 9: 6128(J)

Chlorine isotopes
distribution, between gaseous Cl_2 and Cl^- in aqueous solution, 9: 5299(J)
effect in tert-butyl chloride reactions, 9: 67(J)
mass ratios of, determined from microwave spectra of alkali halides, 9: 811(J)
ratio of Cl^{38}/Cl^{34} from bombardment of Al with heavy ions, 9: 6081(J)
relative abundances of, from mass-spectrometric analysis of $TiCl_4$, 9: 291(J)

Chlorine isotopes Cl^{32}
decay scheme, 9: 2097(J)
half life and activities, 9: 5533(J)

Chlorine isotopes Cl^{34}
beta emission, 9: 1121
decay and half lives, 9: 1680(J)
half life, 9: 2951
gamma spectra and decay scheme, 9: 7893(R)
mass and β spectrum, 9: 7110(J)

Chlorine isotopes Cl^{35}
deuteron reactions (d,α) and (d,p), 9: 2331(R)
deuteron reactions (d,p) and (d,α), energy levels, 9: 4205(R)
neutron reactions in, ranges of recoil atoms from, 9: 7943(J)
nuclear quadrupole spectrum of, 9: 6765(J)
neutron reactions (n,γ) in sodium chlorate, chemical effects, 9: 3424(J)
neutron reactions, (n,p), silver chloride emulsion for study of, 9: 6489(J)
nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)
quadrupole resonance frequencies of, in acid chlorides and chlorates, 9: 4276(J)
quadrupole resonance frequencies of, in solid solutions of organic compounds, 9: 7967(J)

Chlorine isotopes Cl^{35} (cont'd)
saturation of nuclear electric quadrupole energy levels by ultrasonic excitation, 9: 5775(J)

Chlorine isotopes Cl^{36}
formation and half life, 9: 5815
formation of, by pile irradiation of sodium chlorate, 9: 3424(J)
half lives, 9: 2511(J)
magnetic moment and mass, 9: 5485(J)
nuclear magnetic moment, 9: 988(R), 5484(J)
techniques for counting β activity from, 9: 4529(J)

Chlorine isotopes Cl^{37}
neutrino reactions (ν, e^-)A^{37}, neutrino detection by, 9: 2921(J)
nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)
nuclear quadrupole spectrum of, 9: 6765(J)

Chlorine isotopes Cl^{38}
beta-gamma angular correlations, 9: 2515(J)
beta-gamma cascade, differential angular correlation of, 9: 6523(J)

Chlorine isotopes Cl^{39}
mass, determination of best value, 9: 3283(J)

Chlorine oxyfluorides
preparation of, from alkali chlorates and BrF_3, 9: 2187(J)

Chlorochromates
spectra and electronic structure, 9: 4957(J)

Chloroform
bonding of D-labeled, in various solvents, quantitative study by infrared spectrometry, 9: 3060(J)
preparation of D-labeled, 9: 3060(J)
radiosensitivity in dosimeters, 9: 4242(R)
radiosensitivity of mixture of tetrachloroethylene and, 9: 4241(R)

Chlorophylls
biosynthesis of C^{14}-labeled, 9: 2105(J)
new tautomer of, with spectrum similar to chlorophyll-a, 9: 873(J)

Chloroplasts
photosynthesis products of, studied by C^{14}, 9: 7657(J)
role in biochemical functions of plant cells studied by C^{14} and P^{32}, 9: 7656(J)

Chloroplatinates
exchange of chlorine between Cl^- and, 9: 7258

Choline
effects of, on reticulo-endothelial system function in rats, tracer study of, 9: 6574(J)

Choline analogs
effects of high-energy electrons and gamma radiation on, 9: 2198
electron decomposition, 9: 4705(R)
radiation decomposition, 9: 2136(R), 7272(R)

Choline chloride
radiation decomposition, 9: 2136(R)

Cholinergic drugs
protective effects of, against radiation injuries, 9: 2548(R)

Cholinesterases
acetyl-, assay of small amounts of, employing microdiffusion of acetic acid, 9: 5893(J)
effects of total-body irradiation on activity of, in mice, 9: 7633(J)
metabolism of, in brains of rats, 9: 61(R)

Chromatographic separations
combined with specific-activity determination in determinations of radiochemical purity, 9: 3262(J)
of inorganic cations, 9: 1483(J)
of spallation products of Cu, 9: 1485(J)

Chromatography
(See also Electrochromatography.)
automatic scanner for, design, 9: 1484(J)
differential spectrophotometric measurements of reflectance in, 9: 3395(J)
gas, separation and analysis of gases, and volatile liquids by, 9: 2672(J)
of labeled compounds, performance of a 4π β counter for scanning, 9: 3263(J)
microseparation of U(VI) ions from other metals, tracer study, 9: 5267(J)
paper, application to geochemical prospecting, 9: 3404(J)
paper, identification of U by, 9: 4946(J)
paper, manual, 9: 3076(J)
paper, techniques of, general review, 9: 5862(J)
rare earth separation, partition, and transition-element separation on paper impregnated with ion-exchange resins, 9: 3108(J)
recording integrating photoelectric and radioactive scanners, 9: 2393(J)
spectrophotometry of chromatographed copper and cobalt, 9: 6422(J)

Chromel
(See Chromium–nickel alloys.)

Chromic acid
reduction by H_2O_2 in excess $HClO_4$, 9: 7272(R)

Chromium
adsorption of Cr^{6+} on metallic surface of, 9: 4969
determination in Fe alloys, 9: 1901(R)
deuteron excitation cross sections, 9: 2331(R)
dissolved in NaF–KF mixture, relative position in the electrochemical series of, 9: 6310(J)
electrodeposition on motorettes, procedure for, 9: 1554(R)
electroforming from Unichrome CR-110 and chromic acid baths, 9: 3495
electroplating and roll-bonding to Ti, 9: 3477(R)
energy levels study by means of electric excitation by protons, 9: 5476(J)
heat capacities, 9: 5077
melting, forging, swaging, and rolling, 9: 2326(J)
metallurgy, book on, 9: 7380(J)
neutron scattering and γ rays from inelastically scattered neutrons, 9: 3993(R)
physical properties, 9: 6281(R)
polarographic determination of, in Ti-base alloys, 9: 6290
preparation of, by electrolysis of chromic acid, 9: 2326(J)
radiochemical determination, 9: 876
reaction with fused NaOH, 9: 1466(R)
spectrographic determination in Bi, 9: 1475
spectrographic determination in Ti and Ti alloys, 9: 639(R)
spectrographic determination of, in ores and rocks, 9: 162
spectrophotometric determination of, by EDTA complex formation, 9: 4086(J)
tissue distribution of, tracer study, 9: 6864(J)
x-ray spectra (soft), 9: 452(J)

Chromium alloys
casting and forging for gas turbine application, 9: 3869
corrosion in water and aqueous media at 600 and 680°F, 9: 1822
vacuum fusion analysis, 9: 2724

Chromium–aluminum–manganese compounds (intermetallic)
crystal structure, 9: 2373(J)

Chromium–aluminum–molybdenum–titanium alloys
phase structures and tensile properties of as-produced, 9: 2279(R)

Chromium–aluminum–nickel–titanium alloys
surface chemistry of oxidized, 9: 2747(J)

Chromium–aluminum oxide compacts
vibratory compacting, 9: 4173(R)

Chromium–aluminum–titanium alloys
effects of heat treatment on elevated-temperature tensile properties and microstructure, 9: 2719(R)
fabrication, 9: 1534
fabrication and physical properties, 9: 2717(R)
fabrication of joints by pressure welding, 9: 5974(J)
hardness, crystal structure, and phase studies, 9: 3520
hardness, heat treatment, and microstructure, 9: 4186
impact strength and hardness of weld thermal-cycled heat-affected zone of, 9: 1531
microstructure and continuous cooling transformation of, 9: 1531
transformation characteristics, microstructure, heat treatment, and mechanical properties, 9: 4807(R)

Chromium borides
metallurgical properties, survey, 9: 3822(J)
properties of, effect of molten Ti on, 9: 2248
reactions with C and N_2, equilibria studies, 9: 5677(J)
refractory properties, oxidation resistance at elevated temperatures, 9: 4440(J)

Chromium–boron–iron–nickel systems
preparation, casting into ingots, and fabrication into strips, 9: 6994

Chromium–boron–molybdenum systems
physical properties, 9: 150(R)
preparation and physical properties of Borolite IV, 9: 7326(R)

Chromium–boron–nickel systems
hardness measurements, 9: 3822(J)
properties of, as high temperature brazing alloy for thin sheet metals, 9: 1886(J)

Chromium–boron systems
physical properties, 9: 150(J)
preparation and physical properties of Borolite IV, 9: 7326(R)

Chromium carbides
preparation, 9: 6259(J)
solid solubility of, in TiC, 9: 6259(J)

Chromium carbonyls
gas plating of Cu from, 9: 6281(R)
recovery and resublimation, 9: 6280(R)

Chromium–chromium–titanium alloy couples
diffusion coefficients, 9: 2739

Chromium coatings
deposition on Cu, 9: 6281(R)
embrittlement of, on low carbon steel at 475°C, 9: 7812(J)
gas plating method on Cu, 9: 5955(R), 6260(R)

Chromium–cobalt alloys
neutron diffraction studies of magnetic structure of, 9: 2312(J)

Chromium–cobalt–iron alloys
coefficients of linear thermal expansion between temperature ranges −65° and +800°C and phase studies, 9: 7384(J)

Chromium–cobalt–iron–nickel alloys
analysis of, using anion-exchange separations, 9: 1544(J)
weldability of wrought, 9: 3530(J)

Chromium–cobalt–molybdenum alloys
phase studies at 1300°C, 9: 5070(J)

Chromium–cobalt–nickel alloys
static, fatigue, and mechanical properties of wrought N-155 alloy at elevated temperatures, 9: 4170

Chromium–cobalt–nickel alloys (cont'd)
surface tension and wettability, 9: 7752(R)

Chromium–cobalt–nickel–tungsten alloys
mechanical properties, effects of rare earth additions on, 9: 4457
preparation, fabrication, density, tensile properties, microstructure, hardness, and temperature effects of aged and sintered X-40 compacts, 9: 3173
weldability of wrought, 9: 3530(J)

Chromium complexes
with 1,10-phenanthroline, 2,2'-bipyridine, and 2,2',2"-terpyridine, preparation and chemical properties, 9: 512

Chromium compounds
polarographic behavior of, in molten ammonium formate, 9: 7292

Chromium hydroxides
aging, mechanism, 9: 5911(J)

Chromium ions
adsorption on Cr metal surfaces, 9: 4969
interaction of Cr^{3+} and Cr^{6+} in aqueous solutions, 9: 5595(J)
spectrophotometric determination of Cr^{+3} by disodium salt of (ethylenediamine) tetraacetic acid, 9: 3075(J)

Chromium–iron alloys
creep, heat treatment, and tensile properties, 9: 2724
creep, tensile properties, alloying effect of Co, Mo, and Ni on, preparation, 9: 6289
dilatometric determination of $\alpha \rightleftharpoons \sigma$ transformation, 9: 3537(J)
forgeable high-strength, high-temperature, preparation of, effects of additives, 9: 3522
neutron diffraction studies of magnetic structure of, 9: 2312(J)

Chromium–iron–manganese–molybdenum–titanium alloys
mechanical properties and microstructure of extruded and heat treated, effects of temperature, pressure, and die angle on, 9: 2276(R)

Chromium–iron–manganese–molybdenum–titanium–vanadium alloys
heat treatment, mechanical properties, phase studies, tensile properties, and welding, 9: 2298
tensile properties, hardness, and flash weldability, 9: 3856

Chromium–iron–molybdenum–nickel alloys
tensile properties, creep-rupture at 1350 and 1500°F, and microstructure, 9: 3859

Chromium–iron–molybdenum–titanium alloys
tensile properties and ductility, 9: 1848(R)

Chromium–iron–nickel alloys
vacuum melting and casting, 9: 2727(R)

Chromium–iron–titanium alloys
creep of heat-treated and as-received, at 76 and 600°F, 9: 3478(R)
creep of hot-rolled and annealed, at 76 and 600°F, aging effects on, 9: 3479(R)
creep of Ti 150A, 9: 168(R)
drilling tests, 9: 3544(J)
machining and grinding, 9: 4174
machining characteristics of forged Ti-150A, 9: 4168
tensile properties and rupture at 800°F of hot-rolled, 9: 2275(R)
tensile properties at room temperature, effects of creep test conditions on, 9: 2275(R), 2279(R)

Chromium isotopes
stable, concentration by electromagnetic process, 9: 2404

Chromium isotopes Cr^{48}
gamma spectrum and decay scheme in isobaric triplet Cr^{48}–V^{48}–Ti^{48}, 9: 6056(J)

Chromium isotopes Cr^{51}
decay, 9: 3687(J), 6458(J)
estimating, in Fe^{59}–Cr^{51} mixtures in blood, 9: 7461(J)
as a label for red blood cells, 9: 3049(J)

Chromium isotopes Cr^{51} (cont'd)
tagging of red blood cells by, 9: 6864(J)
toxicology of, for cattle, 9: 1156(R)

Chromium isotopes Cr^{52}
angular correlations, 9: 1067(R)

Chromium isotopes Cr^{53}
proton reactions (p,n), 9: 7126(J)

Chromium isotopes Cr^{54}
decay and energy levels, 9: 748(J)

Chromium–manganese–molybdenum–titanium alloys
microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296

Chromium–manganese–titanium alloys
grain structure, hardness, heat treatment, mechanical properties, phase studies, and welding, 9: 2298

Chromium–molybdenum alloys
preparation and physical properties of Borolite IV, 9: 7326(R)

Chromium–molybdenum–nickel alloys
oxidation at 950°C, 9: 3146
weldability of wrought, 9: 3530(J)

Chromium–molybdenum–nickel–tungsten alloys
compressive-stress-rupture properties of high-temperature, 9: 3503(R)

Chromium–molybdenum–titanium alloys
ductility, tensile properties, and effects of composition and stabilizing treatments on stability, 9: 5344(R)
mechanical properties of, effects of grain size and heat treatment on, 9: 3492(R)
mechanical properties of, effects of grain size on, 9: 1837(R)

Chromium–molybdenum–titanium boride systems
refractory properties, 9: 4137(R)

Chromium–nickel alloys
constitution diagrams, Cr rich portion of, 9: 1876(J)
creep, intercrystalline fracture, and grain structure, 9: 4456
magnetization, theory and measurement, 9: 4209
oxidation at high temperatures, mechanism of, 9: 2325(J)
resistance sintering under pressure, 9: 1878(J)
specific heat and enthalpy, 9: 2308(J)
surface tension and wettability, determination, 9: 4777(R)

Chromium–nickel coatings
deposition on Cu, 9: 6281(R)
gas plating on Cu, 9: 5955(R), 6280(R)

Chromium–nickel steel
characteristics of the bainite transformation in, and x-ray-diffraction analysis, 9: 5963
corrosion resistance, effect of Mo addition on, 9: 6332(J)
isothermal embrittlement in, during tempering from 800°F to lower critical temperature, 9: 4188
oxidation, 9: 949

Chromium nitrides
electrical resistance of films of, 9: 2345(J)

Chromium–nitrogen–titanium systems
electrical resistance of films of, 9: 2345(J)

Chromium oxides
heat and free energy of formation, 9: 529(J)

Chromium–oxygen systems
chemical properties, hardness, phase studies, and preparation, 9: 6280
isotopic equilibration determination of O in, 9: 3394

Chromium–oxygen–titanium systems
corrosion, impact tests, mechanical properties, phase studies, properties, and x-ray diffraction analysis, 9: 5654(R)
oxidation resistance, hardness, and tensile strength, 9: 4791(R)

Chromium–oxygen–titanium systems (cont'd)
phase studies, 9: 1874(J)
Chromium phosphates
colloidal, labeled with P^{32}, use in measurements of blood flow in liver, 9: 2609
colloidal, tissue distribution in rats, tracer study, 9: 1725(J)
radioactive, in radiotherapy of effusions associated with carcinomatosis, 9: 7650(J)
Chromium silicides
binding with Ni, properties, 9: 4791(R)
crystal structure, 9: 7272(R)
Chromium–silicon systems
preparation, corrosion, physical properties, and testing, 9: 2740
Chromium steel
corrosive effects of liquid Na on, 9: 5647(J)
effect of current, voltage, and speed travel on welds in, 9: 218(J)
embrittlement of, effect of time and temperature range of 800 to 1260°F on, 9: 2758(J)
heat treatment, effect of CO–CO_2 atmospheres on, 9: 7784
intercrystalline corrosion, due to aging, 9: 4143(J)
isothermal embrittlement in, during tempering from 800°F to lower critical temperature, 9: 4188
oxidation, 9: 949
properties of, at elevated temperatures, 9: 3883(J)
spheroidize annealing, 9: 194(J)
submerged arc welding of, 9: 218(J)
tensile strength of spheroidize annealed, 9: 194(J)
Chromium–titanium alloys
ductility, tensile properties, and effects of composition and stabilizing treatments on stability, 9: 5344(R)
fabrication, 9: 2326(J)
grain boundary diffusion in, as bonding agent between Ti and steel, 9: 4182
hardness, heat treatment, and microstructure, 9: 4186
hardness and phase studies, 9: 1844(R)
tensile properties and microstructure, effects of heat treatment on elevated-temperature, 9: 2719(R)
phase structure and tensile properties of as-forged and heat-treated, 9: 2279(R)
powder preparation, microstructure and x-ray diffraction patterns, 9: 3841(R)
precipitation hardening, heat treatment, and embrittlement of high-strength, 9: 4462
preparation, corrosion, physical properties, and testing, 9: 2740
tensile properties, 9: 3486(R)
x-ray density as a function of Cr and oxidation as a function of density and composition, 9: 3841(R)
Chromium–titanium couples
diffusion coefficients, 9: 2739
Chromium–titanium–vanadium alloys
constitution diagrams and mechanical properties, 9: 4187
hardness, heat treatment, mechanical properties, phase studies, and welding, 9: 2298
Chromium–tungsten alloys
fabrication, 9: 2326(J)
Chromium–uranium alloys
phase studies, 9: 2726
thermal conductivity at 70°C, 9: 1879(J)
Chromium–zirconium alloys
creep-rupture, 9: 190(R)
preferred orientation of cold-rolled and cold-rolled and annealed, 9: 3180(R)
Chromium–zirconium alloys (cont'd)
preparation and fabrication, 9: 3179
tensile properties of, from −195 to 500°C, 9: 3180(R)
tensile properties of, from −195 to 500°C, particle-strengthening effects on, 9: 3179
Chromium yttrium oxides
preparation and crystal structure, 9: 905(J)
Chromosomes
(See also Genetics; Mitosis.)
aberrations induced in, by exposure to ultraviolet radiation and x radiation, 9: 7236(J)
breakage of, in Tradescantia with Ca deficiencies, 9: 3006(J)
duplication, x-ray analysis of, 9: 3027(J)
effects of irradiation with thermal neutrons and x radiation on aberrations and rejoining of, in Trillium, 9: 476
effects of pre- and post-irradiation centrifugation on, of Tradescantia and Vicia, 9: 842(J)
effects of radiation on, in Drosophila, 9: 3021(J), 3023(J)
effects of radiation on, in grasshopper neuroblasts, 9: 2575(J)
effects of x and ultraviolet radiation on, in tomatoes, 9: 1451(J)
radioinduced aberrations in, effects of various radiation dosages, air and nitrogen on, in Tradescantia, 9: 3020(J)
radioinduced aberrations in, in Datura, 9: 5233(J)
radioinduced aberrations in, in Tradescantia microspores, 9: 835(J)
radioinduced aberrations of, effects of fractionated dosage on, in Tradescantia, 9: 4352(J)
radioinduced breakage in, in Tradescantia, 9: 823(J), 2576(J), 4356(J)
radioinduced breakage in, of Vicia, factors affecting, 9: 6160(J)
radioinduced breakage of, effect of 0 tension on, 9: 5859(J)
radioinduced breakage of, rejoining capacity with respect to thermal neutrons and x radiation in Trillium, 9: 1154
radioinduced translocations in, of Drosophila, 9: 4916(J)
radiosensitivity of, in Tradescantia microspores, 9: 2099(R)
recombination in, relationship to synthetic lethals in Drosophila, 9: 7606
recombination of, symposium, 9: 6153(J)
translocation in, following radioinduced aberrations in Drosophila sperm, 9: 7235(J)
Chromyl chlorides
spectra and electronic structure, 9: 4957(J)
Chromyl fluorides
spectra and electronic structure, 9: 4957(J)
Chugwater Formation (Wyo.)
geology, 9: 956(J)
Chuska Mountains Area (Ariz.)
geophysical exploration, 9: 2709
Chymotrypsin
radioinduced inactivation of, 9: 7238(J)
Circle Cliff Area (Utah)
geophysical exploration, stratigraphy, and anomalous radioactivity, 9: 6651
Circle Cliffs Quadrangle (Utah)
photogeologic map of, 9: 4147(J), 4148(J), 4149(J), 4449(J), 4450(J), 5006(J), 5007(J), 5008(J), 5009(J), 5010(J), 5011(J), 5012(J), 5013(J), 5034(J)
Circle Hot Springs Area (Alaska)
geology, 9: 628(J)
Circuits
(See also Coincidence circuits; Feedback systems, Timing circuits.)
adding, for use in cosmic-ray experiments with large Geiger counter hodoscope, 9: 5125(J)

Circuits (cont'd)
analog computer, design, 9: 7445
control, design, 9: 5723
control, for cathode emission in ion sources, 9: 7996(P)
control, for isotope separating device ion sources, 9: 7995(P)
control, for preventing or suppressing sparking in calutrons, 9: 8014(P)
control, for ultra-high vacuum gages, 9: 282(J)
decade-scaler voltage converter for automatic plotting, design, 9: 3242
design and performance, 9: 1282
design for short-resolving-time pulse discriminator, 9: 7056
design of, with high input impedance for measurement of cellular electrophysiological response, 9: 274
design of trigger, for automatic coulometric titrations, 9: 101(J)
digital computer, magnetic materials used in, 9: 6375
flip-flop, for high-speed computers, 9: 5413(J)
matrix analysis of 4-arm bridges, 9: 4206
measurement of currents associated with corrosion by, 9: 6265(J)
mixing preamplifier, for minimum of signal attenuation, 9: 281(J)
for multichannel recording time-delay analyzers, design, 9: 5708(J)
for reading multitube manometer, design, 9: 4476
regulating, for stabilizing klystron oscillators, 9: 8018(P)
scaling, measurement of resolving time of, 9: 5994(J)
switch mechanism for, 9: 8001(P)
theoretical analysis of possible failures, 9: 5075
theory of nonlinear, 9: 7025(R)
Citrate complexes
(See also Beryllium citrate complexes.)
with cerium, spectrophotometric studies, 9: 4964(J)
formation with alkaline earths, anion exchange studies of, 9: 2213(J)
properties of cerium(III), in aqueous and 50% alcohol solutions, 9: 3794
Civilian defense
(See also Radiological defense.)
atomic bomb direction locator, 9: 1437(P)
effects of environment on reducing dose rates from fall-out, 9: 2590
photographic roll film from local drugstores for radiation survey following atomic disaster, 9: 698
safety and lethal effects of atomic explosions, 9: 469(J)
Clancey Mining District (Mont.)
exploration, geology, mineralogy and U-bearing deposits in, 9: 1518(J)
Clark Mountain Mining District (Calif.)
geology, 9: 2708
Clay Hills Quadrangle (Utah)
photogeologic map of, 9: 5033(J), 5040(J), 5043(J), 6973(J), 6986(J), 6987(J)
Clays
(See also Bentonites; Kaolins; Montmorillonites.)
absorption of γ-active Co, La, and Ce-Pr by commercially available, 9: 658
absorption of uranyl ions by, 9: 6559(J)
exchange between D_2O and, 9: 2648(J)
flocculation, 9: 50
fused, design and fabrication of, in radiation sources, 9: 7060
thermogravimetric analysis, apparatus for, 9: 5944
Cleaning
ultrasonic, of hot metallographic samples, 9: 567(J)
Clem Mountain Area (Alaska)
uranium distribution in, 9: 1523(J)
Clevite Research Center, Cleveland
progress reports on Ti powder production, 9: 7785
Cliff Canyon Claim (Ariz.)
mineralogy, 9: 1829
Clothing
(See also Protective clothing; Textiles.)
cotton, decontamination of, evaluation of laundering agents and techniques for, 9: 1704
decontamination, lab-scale tumbler-type washing machine for, 9: 6637
monitoring of, design of a rate meter for, 9: 6404
Cloud chambers
atlas of typical expansion chamber photographs, 9: 3254(J)
continuous diffusion, design, 9: 316(J)
continuous diffusion type, automatic registration of tracks in and working conditions of, 9: 1048(J)
design and performance of 36-atm. diffusion, for use with cyclotron and bevatron, 9: 3253
design, construction, and operation in condensation nuclei studies, 9: 4830
design of, for measurements of ionization and momentum. 9: 6414(J)
design of automatic, 9: 315(J)
design of large rectangular, with external expansion, 9: 5445(J)
detector system for automatic control, 9: 2865(J)
diffusion, improvements in, 9: 1609(J)
diffusion-type, partial pressure region in, 9: 7467(J)
high-pressure, events observed in high-altitude operation, 9: 3563(J)
magnetic, coil design, 9: 2862(J)
magnetic, design, 9: 2808
magnetic, x-ray beam measurement of distortion in, 9: 3596(J)
method for estimating distortion of tracks in, 9: 2421(J)
particle mass determination by deflection in metal plates in, 9: 3327(J)
performance, theoretical study, 9: 5124(J)
photometric measurement of ionization in, 9: 6727(J)
rubber diaphragm, improvement in, 9: 1603(J)
time analysis of Wilson cloud chamber expansions, 9: 1612(J)
tracks in, photometric determination of ionization of, 9: 7874(J)
turbulence reduction by cutting and thermal isolation of metallic absorbers, 9: 2867(J)
window holder design for, 9: 1055(J)
Clouds
(See also Atomic clouds.)
radioactivity after atomic explosions, in France, 9: 2536(J)
Coal
(See also Lignites.)
carbon (C^{13}) abundance, 9: 6276(J)
Coal deposits
mineralogy, 9: 1827(R)
Coal deposits (Ill.)
lithology and radioactivity of samples from, 9: 6653
Coal deposits (Ind.)
occurrence, analysis, 9: 1515
Coal deposits (Mont.)
investigations map of, 9: 5332(J)
Coal deposits (N. Dak.)
investigations map of, 9: 5332(J)
Coal deposits (S. Dak.)
investigations map of, 9: 5332(J)
Coal deposits (U. S.)
occurrence of U bearing, 9: 5326(R)

Coal deposits (W. Va.)
occurrence of radioactive, of Pennsylvanian and Permian age in northern W. Va., 9: 6268

Coal deposits (Wyo.)
occurrence, 9: 2263
uranium distribution, geochemistry, and mineralogy, 9: 7337(J)

Coaldale Area (Nev.)
geology and U occurrence in, 9: 6963

Coatings
(See also specific coatings identified by material, e.g., Ceramic coatings; Metal coatings.)
effect of, on metallic surface wear, 9: 4794
gas plating method for Cr and Cr-Ni on Cu, 9: 5955(R)
metallic, radioautographic inspection, 9: 147
moisture penetration determination by tritium, 9: 2784(J)
operating characteristics of water glass, shellac, paraffin, and lacquer waterproofing, on electrodes in underwater metallic arc welding, 9: 2316(J)
protective, for metals, book on, 9: 4144(J)
radioactive materials on metal powders, process for, 9: 5555(P)
thin alpha-active, radiometric thickness gage for, 9: 1236
on titanium and Ti alloys with Mo, 9: 2752(J)

Cobalt
absorption of β particles in, and relation to surface counting for diffusion measurements, 9: 4000(J)
absorption on clay as simulants for contaminants for nuclear detonations in harbors, 9: 658
chromatographic determination of, in soil samples, 9: 3404(J)
colorimetric determination of, in alloy steels by the tetraphenylarsonium method, 9: 2162
determination in U by ion exchange, 9: 884(J), 1793(J)
determination of, in high-temperature alloys using anion-exchange separations, 9: 1544(J)
diffusion of, in Mo, 9: 1276(J)
effect on high temperature oxidation of Ni, 9: 5364(J)
effects on radiosensitivity of phosphate glass, 9: 1040
effect on creep and tensile properties of Cr-Fe alloys, 9: 6289
influence on diffusion of C in C-Fe systems, 9: 1869(J)
liquid-liquid extraction from Zn, 9: 1224(J)
oxidation rate of, tracer study, 9: 2759(J)
paper chromatography, 9: 6422(J)
quantitative determination of divalent, using a high-frequency oscillator and ethylenediaminetetraacetic acid, 9: 2169(J)
radiochemical determination, 9: 876
in radiotherapy, general discussion of all phases of, 9: 5871(J)
spectrographic determination in Ti and Ti alloys, 9: 639(R)
spectrographic determination of, in ores and rocks, 9: 162
spectrophotometric determination of, by EDTA complex formation, 9: 4086(J)
toxicity of, in lungs of guinea pigs, 9: 6854(J), 6857(J)
toxicity of, with tungsten carbide, in lungs of guinea pigs, 9: 6860(J)
x-ray spectra (soft), 9: 452(J)

Cobalt alloys
with carbon, Si, Mn, Cr, Nb, Ni, Co, Fe, W, Mo, and N, preparation and properties, 9: 3488(R)
casting and forging for gas turbine application, 9: 3869
compression-creep properties, 9: 3504(R)
compressive-stress-rupture properties of high temperature, 9: 3503(R)
corrosion in high-temperature waters, 9: 3459
heat-resisting, development, 9: 7377(J)
properties and reactor applications, 9: 6476

Cobalt alloys (cont'd)
resistance sintering under pressure, 9: 1878(J)
rupture tests on wrought S-816 and U-912, and rupture and tensile strengths of Vitallium, 9: 2720(R)
stress, tensile properties, creep, and relaxation of S-816 at elevated temperatures, 9: 7786

Cobalt-aluminum-molybdenum alloys
oxidation at 954°C, 9: 3146

Cobalt-beryllium-copper-zinc alloys
mechanical properties, 9: 3509

Cobalt-carbon-iron systems
diffusion of C in, influence of Co, 9: 1869(J)

Cobalt chelates
with 2,4-pentanedione, formation constants, enthalpy and entropy, 9: 3390(J)

Cobalt(II) chlorides
density and thermal expansion, 9: 6868

Cobalt-chromium alloys
neutron-diffraction studies of magnetic structure of, 9: 2312(J)

Cobalt-chromium-iron alloys
coefficients of linear thermal expansion between temperature ranges −65° and +800°C and phase studies, 9: 7384(J)

Cobalt-chromium-iron-nickel alloys
analysis of, using anion-exchange separations, 9: 1544(J)
weldability of wrought, 9: 3530(J)

Cobalt-chromium-molybdenum alloys
phase studies at 1300°C, 9: 5070(J)

Cobalt-chromium-nickel alloys
static, fatigue, and mechanical properties of wrought N-155 alloy at elevated temperatures, 9: 4170

Cobalt-chromium-nickel-tungsten alloys
effects of rare earth additions on mechanical properties of, 9: 4457
preparation, fabrication, density, tensile properties, microstructure, hardness, and temperature effects of aged and sintered X-40 compacts, 9: 3173
weldability of wrought, 9: 3530(J)

Cobalt complexes
ammoniacal, H_2 high-temperature, high-pressure reduction, design and performance of equipment for, 9: 1181
with o-phenanthroline and sulfonated oxine, electrodeposition from aqueous solutions of, electronic configuration in, 9: 2625(J)
with 2,2′,2″-terpyridine, colorimetric determination, 9: 512

Cobalt compounds
polarographic behavior of, in molten ammonium formate, 9: 7292

Cobalt fluorides
crystal structure, 9: 6912(J)

Cobalt(II) fluorides
crystal structure, 9: 92(J)

Cobalt glass
in measurement of high doses of γ radiation, 9: 3932

Cobalt ions
equilibrium formation constants for reaction in aqueous solution of acetylacetonate ion with, 9: 1752(J)
separation by ion exchange, 9: 910(J)
solvent extraction, 9: 3111(R)

Cobalt isotopes Co^{58}
nuclear alignment and magnetic moment, 9: 4562(J)
separation of, from Mn target by complexing with α-nitroso-β-naphthol, 9: 119(J)

Cobalt isotopes Co^{57}
beta and gamma spectra, 9: 7197(J)

Cobalt isotopes Co^{57} (cont'd)

decay scheme, 9: 4326(J), 6798(J)

disintegration, 9: 2973(J)

nuclear orientation, 9: 7911(J)

oriented, isotropic distribution of γ radiation from, 9: 6471(J)

separation of, from Mn target by complexing with α-nitroso-β-naphthol, 9: 119(J)

Cobalt isotopes Co^{58}

beta and gamma spectra, 9: 7197(J)

formation of, and use for the preparation of labeled vitamin B_{12}, 9: 1177(J)

magnetic moment, ratio of, to Co^{60}, 9: 6060(J)

separation of, from Mn target by complexing with α-nitroso-β-naphthol, 9: 119(J)

Cobalt isotopes Co^{59}

deuteron reactions (d,p), magnetic analysis of, 9: 1089(J)

proton reactions of, at 60, 100, 170, and 240 Mev, 9: 1091(J)

Cobalt isotopes Co^{60}

absolute measurement of γ radiation from, 9: 1978(J)

absolute standardization by coincidence methods, 9: 6112(J)

application of, in γ defectoscopy, 9: 7749(J)

beads, γ dosage determinations for, 9: 6586(J)

beta decay, lifetimes of excited states of Ni^{60} following, 9: 2509(J)

design and construction of a large animal irradiation unit using, as γ source, 9: 5660

design of γ source containing, 9: 3923

dosage determinations of γ radiation from, 9: 6562

gamma emission, energy measurement by secondary electron absorption, 9: 809(J)

gamma radiation from, distribution of electron energies from, 9: 6418(J)

as gamma source, calibration, 9: 271, 7464(J)

as a gamma source for interstitial, intracavitary, and plaque application in radiotherapy, 9: 843(J)

as gamma source in a 100-c irradiator, 9: 3896(J)

as a gamma source in radiotherapy of lesions of the bladder, 9: 6851(J)

as a gamma source in a teletherapy unit, 9: 497(J)

half life, 9: 2960(J)

high dose rate source for small specimens, design, 9: 2067(J)

intracavitary administration of, 9: 6169(J)

lethal dosage determinations of radiation from, for rabbits, 9: 5858(J)

magnetic moment, ratio of, to Co^{58}, 9: 6060(J)

measurement of integral dose of γ radiation from teletherapy beam of, 9: 1979(J)

protection against radiation from, handbook, 9: 1452(J)

radiation from, intensity of, 9: 5793(J)

in radiotherapy, slide rule nomograms for, 9: 3042(J)

retention in vitamin B_{12}, 9: 2104(J)

rotating teletherapy unit containing, dose distribution and protection requirements, 9: 1726(J)

sanitary regulations in laboratories using, 9: 7643(J)

solutions of, in balloons, in radiotherapy of cancer of bladder, 9: 7651(J)

spheres of, in a suspension, application in intracavitary radiotherapy, 9: 6167(J)

teletherapy unit using, electron filter to improve localization of γ beam, 9: 3040(J)

therapeutic applications to cancer, 9: 1174(J)

therapeutic use of, for bronchial carcinoma, 9: 1169(J)

therapeutic uses, 9: 7253(R), 7644(J)

therapy unit, conversion of a radium beam unit for housing, 9: 2125(J), 2126(J)

therapy unit, scattered radiation from, 9: 2129(J)

Cobalt–manganese–molybdenum alloys

oxidation at 940°C, 9: 3146

Cobalt molybdates

crystal structure and x-ray-diffraction patterns, 9: 3146

phase transformation and spalling in, effect of oxide addition on, 9: 3146

Cobalt–molybdenum alloys

creep-rupture strength of, 9: 633

oxidation testing at 940°C, 9: 3146

Cobalt–molybdenum–nickel–tungsten alloys

compression-creep properties, 9: 3504(R)

Cobalt–molybdenum–silicon systems

oxidation at 945 ± 10°C, 9: 3146

Cobalt–nickel alloys

oxidation, 9: 5364(J)

Cobalt–nickel–uranium alloys

pseudo-binary phase sections between Laves phases in, 9: 3353(J)

Cobalt oxides

heat and free energy of formation, 9: 529(J)

toxicity of, in lungs of guinea pigs, 9: 6856(J)

Cobalt–platinum alloys

thermodynamic properties, 9: 2294(R)

Cobalt systems

mechanical properties of Co oxide cermets, 9: 4139(R)

Cobalt–titanium alloys

grain boundary diffusion in, as bonding agent between Ti and steel, 9: 4182

powder preparation, microstructure, and x-ray-diffraction patterns, 9: 3841(R)

Cobalt–tungsten carbide systems

resistance sintering under pressure, 9: 1878(J)

strength, composition, and grain size of sintered, 9: 2755(J)

Cobb Chemical Lab., Univ. of Va.

progress reports on evaluation of high temperature antioxidants for synthetic base oils, 9: 4115(R)

Cockcroft-Walton accelerators

acceleration of He^3 by, 9: 7098

auxiliaries, 9: 1654(J)

design, 9: 4583(J)

for pulsable neutron generators, design, 9: 3307(J)

Codeine

oxidation by Ag carbonate for preparation of codeinone, 9: 59

Codeinone

preparation by Ag carbonate oxidation of codeine, 9: 59

synthesis of, from codeine in benzene solution and Ag_2CO_3, 9: 61(R)

Coffinites

description, 9: 3838(J)

occurrence in Laguna-Grants areas in N. Mex., analysis, 9: 5948(R)

Coincidence circuits

with amplitude discrimination and accidentals monitoring, 9: 7899(J)

analysis of spurious G-M counter pulses with, 9: 6424(J)

design of cosmic shower selecting, 9: 3560(J)

design of fast response, 9: 3941(J)

for detection of electron pairs and application to study of O^{15}, 9: 7465(J)

detection of possible neutrino-electron interaction with, 9: 6006(J)

fast, for high-energy particles, design, 9: 2416

for measuring cosmic ray intensities at great depths in sea, 9: 5886(J)

photomultiplier tubes in high-speed, prevention of high-voltage breakdown of, 9: 1026(J)

Coincidence counters
cosmic radiation anisotropy studied by narrow angle, 9: 6346(J)
multichannel, design, 9: 5122(J)
Coincidence measurements
application to study of β disintegration, 9: 4526(J)
applied to absolute standarization of Co^{60}, Na^{24}, Sc^{48}, 9: 6112(J)
corrections of, validity of paired source technique for, 9: 5417(J)
electrons accompanying β^- decay studied by, 9: 6368(J)
Coke
crystal structure and mechanical properties, 9: 91
structure and graphitization, 9: 262
Colchicine
effects of, on cell division of hematopoietic cells of tadpoles, 9: 1448(J)
Colfax Sill Area (N. Mex.)
exploration of, U distribution, 9: 955(J)
Colitis
ulcerative, radioinduced in rats, 9: 5849(J)
Collagen
chemical stability of, effect of mucopolysaccharide on, 9: 6820(R)
hydroxylysine of, biosynthesis in rat tissue, tracer study, 9: 6938(J)
microstructure, and effects of Ca and pathologic conditions on, in tails and tendons, 9: 3(R)
structure of, as determined histochemically, by x-ray structure analysis, and with the electron microscope, 9: 7225(J)
Collodion
energy loss of 22-kev electrons, 9: 1665(J)
Colloids
(See also Aerosols; Drops; Silicon oxides (colloidal); Smokes.)
globule size and interfacial tension in, 9: 6884(J)
light scattering functions for spherical particles of, tables, 9: 4299
preparation, a machine for, 9: 6883(J)
preparation and properties of, using Po^{210}, 9: 62
properties of, review, 9: 3063(J)
Colorado
gadolinium minerals distribution in, 9: 7335
geologic map of Naturita NW Quadrangle in, 9: 6969(J)
mineral association in U deposits, 9: 1829
mineral investigations field studies map of Egnar Quadrangle in, 9: 4152(J)
mineral investigations field studies map of Hamm Canyon Quadrangle in, 9: 4150(J)
mineral investigations field studies map of Paradox Quadrangle in, 9: 4151(J)
preliminary geologic map of Calamity Mesa Quadrangle in, 9: 4155(J)
preliminary geologic map of Davis Mesa Quadrangle in, 9: 4154(J)
preliminary geologic map of Gypsum Gap Quadrangle in, 9: 3470(J)
preliminary geologic map of Joe Davis Hill Quadrangle in, 9: 4153(J)
preliminary geologic map of Juanita Arch Quadrangle in, 9: 6271(J)
preliminary geologic map of Uravan Quadrangle in, 9: 6270(J)
Colorado (Fremont Co.)
geophysical exploration in Canon City Embayment Area in, 9: 7757
Colorado (Gunnison Co.)
general geology of the Quartz Creek Pegmatite District in, 9: 4156(J)
Colorado (Larimer Co.)
pegmatite deposits of the Crystal Mountain District in, 9: 3157(J)
Colorado (Moffat Co.)
airborne radioactivity survey of, south of 40° 45′, 9: 5044(J), 5045(J)
mineral determinations in U deposits and prospects in, 9: 5948(R)
Colorado (Montrose Co.)
exploration of Wray Mesa in, 9: 1513
geologic map of Naturita NW Quadrangle in, 9: 7339(J)
preliminary geologic map of Roc Creek Quadrangle in, 9: 7340(J)
Colorado (Pueblo Co.)
geophysical exploration in Canon City Embayment area in, 9: 7757
Colorado (San Miguel Co.)
geologic map of Naturita NW Quadrangle in, 9: 7339(J)
Colorado Plateau
exploration, 9: 1514
exploration for U bearing deposits, 9: 5326(R)
geologic map showing U distribution and ore-bearing formations of, 9: 2271(J)
mineralogy, uranium distribution, 9: 1829
monoclines of, structure, origin, geology, and age, 9: 5951(J)
statistical analysis of contract drilling on, 9: 624
uranium deposits and ore controls in sandstone deposits of, 9: 6273(J)
uranium mineralization on, age, origin, and sedimentary environments of, 9: 6272(J)
uranium mining on, 9: 7332
Colorado. Univ., Boulder
progress reports on luminescence spectra of organic compounds, 9: 3759(R)
Colorimetry
automatic equipment for, 9: 1765(J)
determination of metal ions by annular oven method and spot testing, 9: 3781
Columbia Univ., New York
progress reports on genetic studies, 9: 5(R)
progress reports on minerals from the Delta deposit, Emery Co. Utah, 9: 4998
progress reports on particle size distribution and specific surface studies on phosphate slimes, 9: 6876(R)
progress reports on phosphorylated fabrics, 9: 6228(R)
Columbia Univ., New York. Columbia Radiation Lab.
progress reports, 9: 731(R)
progress reports on microwave technique, 9: 6437(R)
progress reports of Physics Div., 9: 3965(R), 6751(R)
Columbia Univ., New York. School of Mines
progress reports on study of diffusionless phase changes in solid metals and alloys, 9: 1861(R)
Column packing
(See also Distillation apparatus; Extraction apparatus.)
design of, for distillation columns, 9: 4097(J)
Combustion
equipment, electric heater for, 9: 1211
of mixture of gases, effects of β radiation on, 9: 1550(R)
rapid, of metals in air, literature survey, 9: 3178
Combustion analysis
of compounds labeled with isotopes of C and H, 9: 2180(J)
degradation of C^{14}-labeled compounds using a combined combustion-diffusion vessel, 9: 2178(J)
design and calibration of an automatic micromuffle for determination of ash in carbonaceous material, 9: 3398(J)
Commonwealth Engineering Co. of Ohio, Dayton, Ohio
progress reports on gas plated coatings, 9: 5955(R), 6280(R), 6281(R)
Communication systems
image processing by electronic techniques, 9: 5717

Communication theory

behavioral reaction times to acoustic clicks, 9: 7025(R)

Compacts

(See also specific compacts, e.g., Aluminum oxide compacts.)

vibratory compacting, 9: 4173(R)

Compounds

binary, slide rule for converting atomic percent to weight percent, design and performance, 9: 3170

Compressible flow

(See also Gas flow; Incompressible flow.)

coefficient of resistance in, at near sonic velocities, 9: 2233(J)

equations, tables, and charts for, 9: 1245(J)

laminar boundary layer with heat transfer and pressure gradient, theoretical analysis, 9: 4768

viscous mixing of parallel streams of different velocity and temperature, theoretical analysis, 9: 4130

Compression

of alkali metals to 10,000 atmospheres at low temperature, 9: 6667(J)

Compton effect

bipartition angles in scattering by, 9: 6698(J)

double, analysis of, 9: 6444(R)

double, cross sections and energy spectrum, 9: 4617(J)

meson (π^0) production in, 9: 5454(J)

in quantum electrodynamics and pseudoscalar theory, 9: 6551(J)

time delay in, measurement, 9: 4002(J)

Computers

(Calculating devices, mechanical and electrical; see also Mathematics; Memory devices; Mercury delay lines; Reactor simulators.)

analog, design, 9: 7445

application to chemistry and chemical engineering, review, 9: 3249(J)

approximations for hold circuits, 9: 5106(J)

auxiliary memory and parity checking systems, 9: 4842(R)

Bessel functions programming, 9: 1596

bibliography on, 9: 2828, 2829, 4840

bibliography on data storage and recording, 9: 3207

bibliography on machine computation, 9: 5419

calculation of load stability of electric power systems with, 9: 7821

characteristics of 38 models for use in business, 9: 4844(J)

design and operation of ORACLE, 9: 4237

digital, functional approximations for, 9: 6398

electric analogs for solution of heat transfer equations, 9: 2232(J), 3451(J)

electronic adder-accumulator, design, 9: 5563(P)

flip-flop circuits for high-speed, 9: 5413(J)

test and monitor equipment, 9: 2409

theory, design, and performance of a Rachinger conversion slide rule for conversion of atomic weight percent for binary alloys and compounds, 9: 3170

three-dimensional analog, operation of, 9: 1021(J)

Concrete aggregates

properties and use for reactor shielding, 9: 5500(J)

floating-decimal matrix inversion, 9: 4845

high-speed digital, determination of crystal structures with, 9: 2817(J)

image processing techniques applied to, 9: 5717

magnetic drum memory systems for electronic, survey, 9: 1018

magnetic materials used in magnetic circuits of digital, 9: 6375

manual for Maniac, 9: 692

Concrete aggregates (cont'd)

mechanical calculator for background correction in spectrographic analysis, 9: 4087(J)

memory circuits for digital, 9: 2410

program on Univac for reactor multigroup calculations, 9: 7152

solutions of chemical engineering problems by means of, 9: 3387(J)

storage devices, 9: 5099(J)

Concretes

(See also Cements.)

attenuation of broad beam 70 to 250 kvp x radiation by, 9: 2046(J)

cosmic-ray attenuation length in, 9: 676(J)

decontamination, treating surfaces with paraffin for easy, 9: 6334

fast neutron scattering by, 9: 4883

gamma albedos, Monte Carlo calculations of, 9: 5516(J)

gamma scattering in, calculated by Monte Carlo method, 9: 6500

high-density, properties and construction techniques for reactor shielding, 9: 5500(J)

properties and reactor applications, 9: 6476

radon release in radiant heating, 9: 2066

refractory, factors effecting properties, 9: 7328(J)

shielding properties of barytes-colemanite, 9: 6543

spectral and angular distributions of secondary γ rays from source imbedded in, 9: 2490(J)

stress in, gages for measurement of, 9: 2830

Young's modulus of, apparatus for measuring, 9: 6718(J)

Condensation

time lag in self-nucleation, 9: 4721(J)

Conductometric analysis

equipment for, of nitric acid–nitrogen oxide systems, 9: 75

large volume cell for, design, 9: 4094

Conemaugh Formation (W. Va.)

stratigraphy and occurrence of radioactive coal and shale in, 9: 6288

Connecticut. Univ., Storrs

progress reports on distribution studies between melts and solid phases, 9: 6554(R)

Connective tissue

physiologic and histochemical changes in, induced by total-body irradiation in rats, 9: 492(J)

preparation of, for electron microscopy, 9: 1707(J)

Connolly Creek Area (Alaska)

uranium distribution in, 9: 1523(J)

Consolidated Vultee Aircraft Corp., Fort Worth, Tex.

progress reports on metal adhesives, 9: 4114(R)

Constants and conversion factors

(Includes only miscellaneous constants not covered specifically elsewhere.)

analysis of systems of physical units, 9: 7021

theory, design, and performance of a Rachinger conversion slide rule for conversion of atomic to weight percent for binary alloys and compounds, 9: 3170

Constitution diagrams

(See also appropriate subheadings under specific materials.)

liquation establishment of, illustrated by Al–Fe–Si diagram, 9: 6331(J)

of plutonium with various metals, 9: 7796(J)

of uranium and thorium alloys, compilation of, 9: 5349

Continental Oil Co. Central Research Labs., Ponca City, Okla.

progress reports on development of a grease for −100 to +350°F, 9: 2690(R), 6333(R)

Control systems

(See Electric control systems.)

Convection

(See also Heat Transfer.)

thermal, in long cell containing a heat-generating fluid, 9: 4128

Convection (forced)

heat transfer and pressure drop, 9: 5633

heat transfer by, in laminar flow, 9: 2229

Convection (free)

heat transfer by, from heating surface to boiling liquid, 9: 1810(J)

heat transfer by, in laminar flow, 9: 2229

heat transfer by, in vertical tube closed at bottom, 9: 1805

heat transfer from circular finned cylinders by, 9: 1808

heat transfer in an open thermosyphon, theory, 9: 6252(J)

laminar flow analyses for, in fluids having a volume heat source, 9: 1492

Conversion electrons

from palladium (Pd^{103}), characteristics of, 9: 6110(J)

spectral lines of, width of, 9: 5432(J)

Converter reactors

(see Breeder reactors.)

Conveyers

vibrating, movement of material on, mathematical analysis, 9: 2789

Cook Electric Co. Cook Research Labs. Div., Skokie, Ill.

progress reports on pressure elements utilizing pressure-sensitive transistors, 9: 3547(R)

Copper

absorption of cosmic μ mesons, 9: 721

adsorption of aliphatic compounds on, from aqueous solutions as inferred from H_2 overvoltage measurements, 9: 595(J)

adsorption of O_2 on evaporated films of, 9: 2159(J)

attenuation cross sections for 860-Mev protons, 9: 7172(J)

brazing of, with B–Ni–Cr systems, 9: 1886(J)

bremsstrahlung in, electron cross sections for, 9: 6046(J)

bremsstrahlung reactions at 320 Mev, interpretation of results, 9: 3654(J)

bremsstrahlung reactions at 320 Mev, nuclide yields from, 9: 3653(J)

cascade showers in, electron or photon energy from, 9: 7051(J)

chromatographic determination of, in soil samples, 9: 3404(J)

cold-worked, stacking fault probability, 9: 7567

continuous ion exchange with an endless belt of phosphorylated cotton, 9: 3104(J)

corrosion by chlorinated and alkalized boiler water and pure deionized water, 9: 3168

corrosion by F between 100 and 500°C, 9: 6916(J)

corrosion by hydraulic fluids, 9: 2795(R)

corrosion by HCl, effects of high-level γ radiation on, 9: 7755

corrosion by HCl, kinetics, 9: 2251

corrosion by liquid Na, 9: 5647(J)

corrosion by nitric oxide at high temperature, 9: 6308(J)

corrosion by wet and dry Cl_2 between 260 and 300°, 9: 158(J)

corrosion testing, methods for cleaning exposed specimens for, 9: 952(J)

cross sections for neutron transmission and multiplication, 9: 3646(J)

deposition of, by evaporation onto Ti, 9: 7788

detection of inclusions of, in Al by colorimetric spot tests, 9: 1196

determination in U by ion exchange, 9: 884(J), 1793(J)

diffusion coefficients in, effects of neutron irradiation on, 9: 4619

Copper (cont'd)

diffusion of, in α and β brasses, 9: 7008(J)

dissolution of, in nitric acid and in ferric chloride, effects of turbulent flow, 9: 3448(J)

effects of H on, during electrolytic pickling, 9: 1272(J)

elastic scattering of α particles, 9: 7893(R)

elastic spectrum of, from temperature-diffuse scattering of x rays, 9: 2802(J)

electrodeposition, effect of Li ions, 9: 1195(J)

electroforming from fluoborate, acid sulfate, Unichrome C-10X, and Wes-X cyanide baths, 9: 3495

electron and positron absorption in, 9: 415(J)

electron energy losses in thin foils of, 9: 5790

emission of secondary electrons (δ rays) by 1.3-Mev electron bombardment, 9: 1306(J)

energy loss of secondary electrons in a cavity with walls of, 9: 2045(J)

expansion, effects of radiation on, 9: 6868

gamma reactions (γ,n), 9: 1358(J)

gamma reactions (γp) at 19.0 to 30.5 Mev, angular distribution and yield, 9: 5508(J)

growth of plastic deformation in, 9: 177

heat capacities, 9: 5077

imperfections and radiation damage studies by means of electric property measurements, 9: 4452

lattice defects and electrical resistivity in cold-worked and irradiated, 9: 2330

neutron absorption and total cross sections at 1.4 Bev, 9: 5486(J)

neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)

neutron irradiation effects in, at 80°K, 9: 4622(J)

neutron irradiation of, changes in Young's modulus and internal friction, 9: 7568(J)

neutron reactions (n,π^-) at 400 Mev, cross section, 9: 6011(J)

neutron reactions (n,nγ), γ yields and energies from, 9: 4204(R)

neutron reactions (n,π^0), 400 Mev cross section, 9: 5742(J)

neutron total cross sections, 9: 7124(J)

nitrogen nucleus reactions (N^{14}), decay of As^{72} produced by, 9: 6800(J)

nuclear magnetic moments, 9: 2895

number of vacancies and energy of vacancy formation in, 9: 3525(J)

oxidation, isotope effect of O^{18} in, 9: 850

oxidation of, under conditions of linear temperature increase, 9: 182

paper chromatography, 9: 6422(J)

periodic potential solutions for the solid state, 9: 231(R)

photon reactions (γ,n), 250 Mev, 9: 6772(J)

photon scattering cross section, 9: 4205(R)

photoneutron yield, measurement with NaI crystal, 9: 3944(J)

photonuclear reactions, 9: 2449(J)

physical properties, 9: 6281(R)

plating with Cr and Cr–Ni alloys, 9: 6280(R)

plating with chromium and chromium nickel, by gas plating method, 9: 5955(R)

polarization of, in 3% NaCl solution, 9: 2259(J)

polarographic behavior and electrodeposition, 9: 519

polishing of, with alumina abrasives, technique, 9: 3879(J)

pressure-compression date for, from shock wave measurements, 9: 3876(J)

production, fabrication, metallurgy, properties and corrosion, review, 9: 2300(J)

production of negative H ions, by 11.5- to 28-kev protons in, 9: 6789(J)

proton-proton coincidences in, produced by 340-Mev γ rays, 9: 7586(J)

Copper (cont'd)

proton range in, 1- to 7-Mev, 9: 6788(J)

proton reactions (p,n), angular distributions and yields at 23 Mev, 9: 4290(J)

proton scattering by, differential cross sections for, at 5.25 Mev, 9: 7178(J)

proton stopping cross section, 9: 2026(J)

quantitative determination of divalent, using a high-frequency oscillator and ethylenediaminetetraacetic acid, 9: 2169(J)

radiation damage and tensile properties of electron-irradiated, 9: 7389(R)

radiation effects of 12-Mev deuterons on, near 10°K, 9: 2946(J)

radiometric determination, 9: 2634

reaction with fused NaOH, 9: 1466(R)

sample preparation from arsenic target for counting, 9: 2676(J)

scattering of 19-Mev α particles from foils of, 9: 7522(J)

secondary electrons from, for primary electrons of 20 kev to 1.3 Mev, 9: 5989(J)

self-diffusion coefficient, 9: 1278(J), 5348(R)

shear modulus of irradiated and cold-worked wires, effect of annealing, 9: 2330

sintering, 9: 4777(R)

slowing down of polarized protons by, 9: 2039(J)

spallation by 280-Mev deuterons and 480-Mev protons, yields and cross sections, 9: 7938(J)

spallation by 660-Mev protons, cross sections, 9: 7939(J)

spallation by 190-Mev protons and deuterons and 90-Mev protons and neutrons, 9: 6075(J)

spallation products of, with 60-Mev protons, chromatographic separation of, 9: 1485(J)

spectrochemical determination of, in Ti and Ti alloys, 9: 4944

spectrographic determination of, in ores and rocks, 9: 162

stress values of, chart and nomograph for, 9: 3441(J)

three-quantum annihilation of positrons in, 9: 249(J)

wetting by Hg, 9: 5052

wetting by liquid Na, 9: 229(J)

x-ray-diffraction analysis, 9: 7567

x-ray spectra (soft), 9: 452(J)

Young's modulus, effects of cold deformation on, 9: 2769(J)

Copper (liquid)

permeation of graphite by, mechanism of, 9: 4480

Copper alloys

corrosion testing, methods for cleaning exposed specimens for, 9: 952(J)

corrosive effects of liquid Na on, 9: 5647(J)

creep properties of internally oxidized, 9: 5367(J)

fabrication, metallurgy, properties, and corrosion, review, 9: 2300(J)

fatigue and stress, 9: 4159

nuclear magnetic moments, 9: 2895

polarization of, in 3% NaCl solution, 9: 2259(J)

polishing of, with alumina abrasives, technique, 9: 3879(J)

radiation-induced resistivity changes and lattice parameters, 9: 5382(R)

Copper–aluminum alloys

creep, activation energies for, 9: 5961

creep and tensile properties of, effects of alloying elements on, 9: 6295(J)

creep of, effects of structure on, at high temperature, 9: 2732

creep of, grain-boundary movement, slip, and fragmentation during, 9: 2321(J)

electrolytic polishing, 9: 4189(J)

fatigue strength, 9: 5060

Copper–aluminum alloys (cont'd)

fatigue testing in different stress ranges, 9: 5061

intercrystalline corrosion, due to aging, 9: 4143(J)

intercrystalline grains in growth of, determined by the method of micro-hardness, 9: 642(J)

magnetic susceptibility and change of state on tempering, 9: 4192(J)

relaxation effects in solid solutions of, arising from changes in local order, 9: 204(J)

relaxation strength, 9: 1537(J)

single crystals, preparation and plastic deformation, 9: 5668(J)

stress, temperature effects on, 9: 5668(J)

structural changes of, observed by electron diffraction, 9: 6322(J)

surface energy, 9: 6286(R)

Copper–aluminum–cadmium alloys

metallurgy, corrosion behavior, and applications, 9: 6324(J)

Copper–aluminum couples

preparation and grain-boundary diffusion, 9: 971(R)

solid state bonding, tensile properties, and intermetallic penetration, 9: 6303(J)

Copper–aluminum–magnesium alloys

aging characteristics, 9: 2323(J)

fatigue testing in different stress ranges, 9: 5061

Copper–aluminum–magnesium–manganese alloys

effects of heat treatment on corrosion, 9: 4143(J)

exaggerated grain growth of extruded, 9: 1545(J)

fretting corrosion, fatigue, surface friction, 9: 6262

Copper–aluminum–magnesium–silicon systems

constitution diagrams at 460°C, 9: 6298(J)

Copper–aluminum–magnesium–zinc alloys

fatigue testing in different stress ranges, 9: 5061

Copper–aluminum–nickel alloys

diffusionless phase transformation, crystal structure, heat treatment, and thermal expansion, 9: 1861(R)

Copper–aluminum–silicon systems

corrosion resistance and mechanical properties of, effects of variation of zinc content on, 9: 3541(J)

effects of vibration on solidifications, 9: 3851

Copper–aluminum–zinc alloys

spiral substructures in β phase, 9: 1881(J), 1882(J)

Copper arsenides

electric conductivity, 9: 1467(R)

Copper–beryllium alloys

alloying effect of Be on properties of, 9: 982(J)

corrosion by hydraulic fluids, 9: 2795(R)

effects of radiation on, 9: 4820(J)

heat treatment in a 60-kev horizontal furnace, 9: 1891(J)

phase studies, 9: 2748(J), 4472(J)

Copper–beryllium–cobalt–zinc alloys

mechanical properties, 9: 3509

Copper–brass couples

interdiffusion of, pores formed during, 9: 5362(J)

Copper bromides

viscosity and electrical conductivity relationship in solutions of, 9: 1187(J)

Copper–calcium alloys

crystal structure, 9: 683(J)

Copper chelates

chemical properties of, 9: 512

with diketones, spectra and structure of, effect of F substitution on, 9: 6219

Copper chelates (cont'd)
with 2,4-pentanedione, formation constants, enthalpy, and entropy, 9: 3390(J)
spectra, effect of F substitution on, bonding in, 9: 7675
Copper chloride–potassium chloride systems (liquid)
electric conductivity, 9: 2139(J)
Copper complexes
with 1,10-phenanthroline, chemical properties, 9: 512
with o-phenanthroline, sulfonated oxine, and dimethylglyoxime, electrodeposition from aqueous solutions of, electronic configuration in, 9: 2625(J)
Copper compounds
polarographic behavior of, in molten ammonium formate, 9: 7292
Copper crystals
electroplating of, with Cu, 9: 519
grain-boundary diffusion of Ag in, anisotropy of, 9: 1285(J)
internal friction of, effects of annealing and plastic deformation on, 9: 5054
self-diffusion in, tracer study, 9: 4531(J)
wetting of, by stearic acid, 9: 6246(R)
Copper, cyclopentadienyltriethylphosphine-
synthesis and reactions, 9: 4368
Copper films
x-ray-diffraction analysis of surface properties, 9: 186
Copper fluorides
x-ray and electron microscope examination of, 9: 6916(J)
Copper–gold alloys
electrical resistance at low temperatures, 9: 5072(J)
electrolytic polishing, etching, and grain structure, 9: 2765(J)
x-ray-diffraction analysis of Cu_3Au, 9: 7567
Copper–gold alloys (liquid)
thermodynamic properties, 9: 188(R)
thermodynamic properties and phase studies, 9: 5662
Copper–gold compounds (intermetallic)
energy relations in, colorimetric investigation of, 9: 2764(J)
ordered, electron diffraction study of, 9: 205(J)
Copper ions
adsorption on sphalerites, 9: 4980
adsorption of, on sphalerite, effect of ammonia concentration, 9: 623(R)
adsorption of, on sphalerite and NaCN, 9: 3111(R)
equilibrium formation constants for reaction in aqueous solution of acetylacetonate ion with, 9: 1752(J)
Copper isotopes Cu^{59}
disintegration and mass, 9: 7918(J)
Copper isotopes Cu^{62}
gamma spectrum and its relation to mass measurements, 9: 2964(J)
production by γ radiation of Cu^{63}, 9: 6486(J)
Copper isotopes Cu^{63}
alpha cross sections and proton energy distribution from (α,p) reaction, 9: 7893(R)
gamma reactions (γ,n), 9: 6486(J)
nuclear magnetic resonance of, at 299 and 77°K, 9: 61(R)
nuclear spin-lattice relaxation time, 9: 5774(J)
proton reactions (p,n), 9: 1067(R)
proton reaction (p,n), threshold value in, 9: 7551(J)
Copper isotopes Cu^{64}
half life, 9: 2960(J)
Copper isotopes Cu^{65}
alpha cross sections and proton energy distribution from (α,p) reaction, 9: 7893(R)
Copper isotopes Cu^{65}(cont'd)
nuclear magnetic resonance of, at 299 and 77°K, 9: 61(R)
proton reactions (p,n), 9: 1067(R)
proton reaction (p,n), threshold value in, 9: 7551(J)
Copper–lanthanum alloys
crystal structure, 9: 683(J)
Copper–nickel alloys
corrosion by chlorinated and alkalized boiler water and pure deionized water, 9: 3168
corrosion in high-temperature waters, 9: 3459
magnetic and thermal properties, theory and measurement, 9: 4209
tensile properties of commercial and high-purity, effect of temperature on, 9: 2309(J)
welded joints of, with stainless steel, thermal rupture, 9: 1264
Copper–nickel couples
diffusion in, effects on cross section area, 9: 3526(J)
diffusion processes in, 9: 4191(J)
Copper oxides
heat and free energy of formation, 9: 529(J)
isotopic equilibration determination of O in, 9: 3394
photo-electromotive forces in, 9: 3761
solution in H_2SO_4, mechanism of, 9: 849
Copper–oxygen systems
isotopic equilibration determination of O in, 9: 3394
Copper–palladium alloys
constitution diagrams, crystal structure, heat treatment, physical properties, and preparation, 9: 3174
Copper–platinum alloys
thermodynamic properties, 9: 2294(R)
Copper powders
sintering of, porosity and permeability changes during, 9: 3534(J)
Copper selenides
electric properties, 9: 4266(R)
resistivity, 9: 1904(R)
Copper–silicon crystals
radiation effects in, x-ray diffraction analysis, 9: 2496
Copper–silicon systems
galling and seizing of, by friction coefficients, 9: 1269
Copper–silver alloys
phase studies and thermodynamics, 9: 5357(R)
Copper sulfate–iron sulfate systems (liquid)
radiation chemistry of aqueous solutions of, 9: 2661(J)
Copper sulfates
radiolysis of aqueous solutions of, effect of solutes on yields in, 9: 7716(J)
Copper sulfides
entrainment of P^{32} on, 9: 862(J)
molten, self-diffusion of Cu, 9: 1467(R)
Copper sulfides (liquid)
electric conductivity of, as a function of S activity, 9: 7269(R)
electric conductivity of, effect of TiS_2 on, 9: 7269(R)
Copper–tin alloys
diffusionless phase transformation, 9: 1861(R)
heats of formation and precipitation in, calorimetric investigation of, 9: 199(J)
Copper–titanium alloys
heat treatment, mechanical properties, and microstructure, 9: 1875(J)
preparation by nonconsumable and consumable electrode arc melting, 9: 2293(R)

Copper–titanium alloys (cont'd)

room-temperature dynamic elastic modulus and its ratio to density, 9: 2728(R)

Copper–uranium sandstone deposits (Ariz.)

occurrence in Ridenour Mine, 9: 7334

occurrence in Willaha Area, 9: 6652

Copper–uranium sandstone deposits (Utah)

occurrence in White Canyon Area, 9: 1512

Copper–zinc alloys

(See also Brass.)

diffusion coefficients for, 9: 5348(R)

relaxation effects in solid solutions of, arising from changes in local order, 9: 204(J)

relaxation strength, 9: 1537(J)

Cordierites

thermal fracture under quasi-static thermal stresses, 9: 1506(J)

Core drilling

(See Rock drilling.)

Cornell Aeronautical Lab., Inc., Buffalo

progress reports on compressive-stress-rupture properties of high-temperature materials, 9: 3503(R), 3504(R)

progress reports on development of substitute alloys for high-temperature service, 9: 3502(R)

progress reports on relaxation of Ti and Ti alloys, 9: 3505(R), 3506(R)

progress reports on Ti brazing, 9: 4793(R)

Cornell Univ., Ithaca, N. Y.

progress reports on reaction kinetics, 9: 6874

Corrosion

(See also appropriate subheadings under corroded materials and units and under corrosive agents; see also Electrochemical corrosion; High-temperature corrosion; Stress corrosion.)

adsorptive beginning of corrosive fatigue of metals, 9: 4811(J)

of aluminum, Al–stainless steel couples, Al alloys, and stainless steels in fuming nitric acid, design and performance of equipment for, 9: 2255(J)

application of theory of local cells to, 9: 4783(J)

book, "Protective Coatings for Metals," 9: 4144(J)

cavitation, effect of slot streams, 9: 3147

cavitation, resistance of metals to, in fresh water and sea water, 9: 3148(J)

of copper by HCl, kinetics, 9: 2251

eddy-current type diameter gage for measurement of, 9: 618

electrochemical applications to investigation of, discussion of, 9: 6648(J)

equipment for testing, design and performance, 9: 1508

high temperature corrosive data, 9: 4443(J)

inhibition, theoretical basis for investigating, 9: 3460(J)

measurement and testing with electric contact resistance equipment, 9: 1948(J)

measurement of currents associated with, instruments for, 9: 6265(J)

of metals, development of oscillating furnaces for testing, 9: 6649(J)

of metals, effects of high-level γ radiation and temperature on, 9: 7755

of nickel by molten NaOH, effect of mass transfer on, 9: 951(J)

nomograph for converting rates of, 9: 2254(J)

pitting, system for rating, 9: 1510(J)

prevention of, by metal spraying, 9: 3150(J)

relationship between potential value, corrosion, and corrosion passivity of metals in aqueous solutions, 9: 4784(J)

resistance of 2S aluminum, 9: 5352

testing, methods for cleaning of exposed specimens for, 9: 952(J)

testing procedures for stress-corrosion in metals, 9: 5321(J)

Corrosion (cont'd)

valves for corrosive fluids, 9: 6960(J)

Corrosion films

removal of, from reactor structural materials corroded by high-temperature water, 9: 154

Corrosion inhibitors

(See also Antioxidants.)

effectiveness of, for Al and steel, 9: 947(R)

effectiveness of, for C steel in acid medium, 9: 156(J)

effectiveness of, for stainless steel in liquid Na, 9: 6958

effectiveness of Na dichromate–chloramine mixtures for corrosion of Al, Zn, steel, and Al-stainless steel and Zn-stainless steel couples by H_2O, 9: 153

effectiveness of pertechnetate ion as, 9: 1825

protective action of pigments as, on steel, 9: 2258(J)

Corrosion loops

cleaning of Na from, with NH_3, 9: 4179(R)

cleaning of Na from by flushing with liquid Na or NaK, 9: 4175(R)

contamination and performance of liquid Na, 9: 1903

design, 9: 948

design, for liquid Na, 9: 1897(R), 1898(R)

design and operation of liquid–Na, 9: 1899(R)

in-pile, disassembly of, exposed in Low Intensity Training Reactor, 9: 752(J)

in-pile, stress and temperature gradient determination, 9: 6254

radioactive leak contamination in, measurement, 9: 4175(R)

stainless-steel, design and performance, 9: 6477

thermal and hydrodynamic characteristics of liquid Na, 9: 1900(R)

Corrosion-resistant alloys

preparation of aluminum–nickel alloys, 9: 6991

specific heat and enthalpy, 9: 2308(J)

survey, corrosion data charts, and directory, 9: 137(J)

Corrosive materials

high temperature corrosive effects on metals and alloys, review, 9: 4443(J)

Corticosterones

chromatographic determination of, in animal tissues, 9: 3365

effect of x-irradiation on, 9: 4750(J)

Corticotropin

therapeutic uses of, in acute radiation syndrome, 9: 2123(J)

Cortisone

effects of, on acute radiation syndrome in mice, 9: 838(J)

effects of, on response of lethally irradiated mice to injections of rat bone marrow, 9: 4051

effects of, on survival time in x-irradiated rate, 9: 2591

effect of x-irradiation on, 9: 4750(J)

Cosmic electrons

electron-photon cosmic cascade, distribution of photons in, 9: 5687(J)

high energy, angular distribution in air showers, calculation of, 9: 2[illegible]

production and energy transfer from nuclear interactions, 9: 1565

production by high-energy photons, 9: 2813(J)

production cross section of triplets by electron pairs, 9: 1300(J)

production from electron interactions, 9: 1575(J)

Cosmic mesons

angular distribution and east-west asymmetry, 9: 1917(J)

daily variation of, studied by narrow angle telescopes, 9: 6346(J)

daily variation of intensity, cycle of world-wide changes in, 9: 257(J)

daily variation of intensity at low latitudes, 9: 7414(J)

Cosmic mesons (cont'd)
decay, equipment for detection of, 9: 7477(J)
intensity variations, meteorological factors, 9: 5397(J)
masses of, by optical photometry, 9: 7490(J)
production, latitudinal effects, 9: 1921(J)
production of, by cosmic proton collisions, 9: 674(J)
residual range of delayed, in Pb, 9: 679(J)
Cosmic mesons (μ)
geomagnetic effects on formation of, 9: 258(J)
interaction cross section of, with nucleons, 9: 7832(J)
low-energy differential range spectrum of, 9: 1003(J)
momentum distribution and charge ratio at zenith angles in E-W plane, 9: 680(J)
momentum spectrum at sea level, 9: 4833(J)
observations of, in nuclear emulsions at 17 m.w.e. underground, 9: 7042(J)
spectra of, analysis used to calculate air spectrum of mesons, 9: 256(J)
underground penetration, 9: 1293(J)
Cosmic mesons (π)
flux in nuclear emulsions exposed underground, 9: 7832(J)
mean free path for shower production by, 9: 1925(J)
spectra at sea level, transition curve for lead, 9: 5394(J)
spectra of, calculated from μ-meson spectra, 9: 256(J)
Cosmic mesons (π^0)
conversion of two photons into, 9: 5454(J)
in penetrating showers produced in Pb and C at 11,200 ft, 9: 1929(J)
production in Compton effect, 9: 5454(J)
Cosmic neutrons
density, latitudinal variation, 9: 2363(J)
high-altitude density of, at the geomagnetic pole, 9: 3564(J)
intensity at various atmospheric depths and geomagnetic latitudes, 9: 6341
measurement below H_2O by nuclear emulsions, 9: 3946(J)
neutron-proton ratio at 400 Mev, 9: 4493(J)
Cosmic particles
acceleration of, in interstellar space, 9: 682(J)
angular distribution and transition effect for individual, 9: 3559(J)
angular distribution of, in the stratosphere, 9: 3905(J)
angular distribution of star-producing, 9: 5690(J)
charge of primary, measurement by nuclear emulsion scattering, 9: 5732(J)
Cherenkov radiation by, in atmosphere, 9: 1920(J)
cloud chamber data, collection, reduction, and analysis of, 9: 2808
detection by bismuth-fission ionization chambers, 9: 5116
disintegration, 9: 2808
flux of primary, of atomic number $Z \geq 2$ at geomagnetic latitude 30°, 9: 2361(J)
heavy, interactions with target materials, 9: 2815(J)
heavy nuclei in primary cosmic radiation, 9: 7412(J)
heavy unstable, nuclear disintegrations associated with, 9: 6426(J)
high-energy interactions in nuclear emulsions, 9: 6343
of high Z, at equator, 9: 5979
mass spectrum, 9: 5089(J)
masses at sea level, 9: 5393(J), 5980(J)
measurements of masses of, in stars, 9: 7478(J)
primary alpha, flux measurements with Cherenkov detector, 9: 5738(J)
production of particles in collisions, theory, 9: 5195(J)
properties and decay schemes, 9: 2809(J)
Cosmic particles (cont'd)
residual range of delayed, in Pb, 9: 679(J)
time coherence of associated, under Pb and air, 9: 1301(J)
Cosmic photons
conversion into π^0 mesons, 9: 5454(J)
electron-photon cascade, distribution of photons in, 9: 5687(J)
spectrum of, in lower atmosphere, 9: 1571(J)
Cosmic protons
absorption in atmosphere, 9: 3235(J)
angular distribution, 9: 1917(J)
diffusion in interstellar medium, equations for, 9: 4222(J)
intensity and distribution of 400-Mev, 9: 4493(J)
momentum spectrum, absorption range, and production at 3200 m elevation, 9: 3907(J)
observations of, in nuclear emulsions at 17 m.w.e. underground, 9: 7042(J)
as primary component of cosmic radiation, production of cosmic mesons by, 9: 674(J)
range in Pb, 9: 1922(J)
variation with altitude and latitude, 9: 7410(J)
Cosmic radiation
absorption analysis of star emitted components of, 9: 6688(J)
absorption in atmosphere, 9: 3235(J)
absorption in Pb at varying altitude, 9: 678(J)
abundance of Li, Be, and B in primary, 9: 1299(J)
acceleration of, by electromagnetic induction in galaxies, 9: 673(J)
acceleration of, by hydromagnetic waves, 9: 5983(J)
alpha-particle component of, determination, 9: 1007(J)
alpha particle measurement with Cherenkov counters, 9: 255
alpha particles in, near geomagnetic equator, 9: 1292(J)
amplitude changes of 27-day intensity variation with solar activity, 9: 1002(J)
analysis of charge spectrum of, for light elements, 9: 6342
anisotropy at low latitudes solar influence on, 9: 7414(J)
anisotropy of, studied by narrow angle telescopes, 9: 6346(J)
anisotropy of high-energy, 9: 675(J)
antiproton event in, photons emitted in annihilation of, 9: 261(J)
asymmetries in E-W distribution, 9: 2810(J)
attenuation in concrete and bursts in NaI (Tl) near sea level, 9: 676(J)
biological effects of, contribution of ionization dosage from heavy nuclei in living tissue, 9: 3362
biological effects of, on aviation personnel, 9: 34(J)
biological effects of tissue ionization dosage from, 9: 3726
cascade, distribution of photons in, 9: 5687(J)
cascade theory, generating functions, 9: 1919(J), 5396(J)
composition of primary component at λ 10°N, 9: 1297(J)
distribution of stars of, in nuclear emulsions, 9: 260(J)
energetic disintegration of a heavy nuclear fragment found in high altitude, 9: 677(J)
energy dissipation and balance of, 9: 7040(J)
energy loss of nuclear component by ionization, 9: 1924(J)
energy spectra of heavy primary, 9: 1296(J)
energy spectrum of low-energy γ component, 9: 3565(J)
at equator, primary flux of, azimuthal assymetries of, high Z particles in, 9: 5979
geomagnetic effects on formation of μ mesons by, 9: 258(J)
heavy nuclei in primary, measurement of, 9: 7412(J)
intensity, recurrence phenomenon in 24-hour, 9: 4218(J)

Cosmic radiation (cont'd)
intensity above atmosphere at high latitudes, 9: 5982(J)
intensity fluctuations at sea level, 9: 1004(J)
intensity variations, meteorological factors, 9: 5397(J)
interaction with N, production of Be^7 by, 9: 3655(J)
interactions with nucleons underground, cross section for, 9: 1006(J)
ionization bursts at sea level, size-frequency distributions of, 9: 7416(J)
latitude curve, explanation of "knee" in, 9: 4495(J)
latitude effect at low altitudes, 9: 4217(J)
latitude effects and correlation with E-W asymmetry, 9: 2811(J)
latitudinal variations, meteorological factors for hard-component, 9: 1921(J)
low-rigidity cutoff for particles in, change with time, 9: 7415(J)
mass spectra of, at sea level, measurement by magnetic mass spectrograph, 9: 1918(J)
mean-life determinations of unstable charged particles from, 9: 1009(J)
measurement at great depths in sea, apparatus for, 9: 5686(J)
measurement of multiply charged, by Cherenkov radiation, 9: 254
K-mesonic decay of a slow secondary particle in, 9: 3236(J)
mesonic decay of excited triton ejected from type 21 + 5p star, 9: 4220(J)
momentum distribution and charge ratio of penetrating component, 9: 680(J)
momentum spectra and positive excess at 3,650 m, 9: 3562(J)
nature of, outline, 9: 3906(J)
nuclear cascade theory, 9: 2366(J)
nuclear disintegrations produced in Pb at 3500 m by, 9: 259(J)
nuclear interaction of He nuclei in, 9: 4494(J)
nucleon-nucleon collisions produced by, properties of secondary particles in, 9: 7417(J)
origin, 9: 1923(J), 2812(J)
origin and acceleration, 9: 3233(J)
origin, relation to novae, 9: 5689(J)
origin of, as derived from cosmic shower production, 9: 681(J)
positive temperature effect in, role of π mesons in, 9: 6347(J)
primary, existence of antiprotons in, 9: 7411(J)
primary intensity changes in, association of "unipolar" magnetic region of sun with, 9: 5392(J)
production spectra of μ and π mesons in atmosphere, 9: 1298(J)
progress in physics of, review of, 9: 2364(J)
proton component of, variation with altitude and latitude, 9: 7410(J)
protons as primary component of, 9: 674(J)
relation between intensities of, and heights of isobar levels, positive temperature effect in, 9: 1566(J)
relation of tritium production by 2.2-Bev protons on Fe to, 9: 3651(J)
review, 9: 2809(J)
scattering and intensity of secondaries in the atmosphere, 9: 3234(J)
size frequency distribution of ionization bursts from, in A-filled 8-inch diam. spherical ion chamber, 9: 4490
soft component, direct detection above 50 km in auroral zone, 9: 1928(J)
spectra of proton and ionic component of, break in, 9: 455(J), 7030(J)
statistical estimate of exponent of energy law for primary, 9: 1568(J)
theory, 9: 7831(J)
theory and bibliographies, 9: 7830(J)
time variation of intensity at sea level, 9: 1570(J)
underground, nuclear emulsion observation of, 9: 7832(J)
underground penetration, 9: 1293(J)
unstable heavy meson decaying in flight in photographic emulsion exposed at high altitudes, 9: 1294(J)
zenithal angle dependence of hard and soft components, 9: 259(J)

Cosmic-ray spectra
analysis of, for light elements, 9: 6342

Cosmic-ray spectrometers
design, 9: 1570
operation of hodoscope, 9: 1295(J)

Cosmic showers
analysis of 3×10^{13} ev, 9: 1927(J)
angular distribution of high energy electrons in, calculation of, 9: 2361(J)
cascade theory, numerical calculations of fluctuation problem in, 9: 6302
counting rate vs. absorber thickness curves, explanation of second maxima, 9: 4832
density and zenith angle distribution of, at 2760 m., 9: 7041(J)
diurnal variations in solar and sidereal time of and origins of, 9: 5981(J)
electron production in high-energy nuclear interactions, 9: 1565
energy and angular distribution of mesons in cosmic jets, 9: 1008(J)
energy effects in the production of, by μ mesons, 9: 5136(J)
energy spectrum by multiplate cloud chambers, 9: 1567(J)
extensive, distribution of nuclear-active particles in, 9: 5091(J)
extensive, geometry of nuclear active component, 9: 2367(J)
extensive, spatial distribution of charged particles near axis, 9: 7038(J)
high-energy, relativistic particles in, 9: 5984(J)
lateral distribution of various components of, at sea level, 9: 4223(J)
mass spectrum of particles in nuclear emulsions from cosmic ray interactions, 9: 4219(J)
meson production theories applied to, 9: 7039(J)
π mesons in, 9: 6013(J)
momentum spectrum of sea level penetrating secondaries, 9: 7413(J)
penetrating component, properties, 9: 5395(J)
production of, in Li, C, Al, and Pb, 9: 4489
residual range of delayed particles in Pb, 9: 679(J)
second maxima in transition curve, 9: 4492(J)
selecting circuit for, design, 9: 3560(J)
time variations of, production of, 9: 681(J)
variation of rate of, with sidereal and solar time, at sea level, 9: 6344(J)
zenithal effect at low altitudes, 9: 5692(J)

Cosmology
radioactivity as an aid in study of, 9: 2265(J)

Cosmotron
(See Brookhaven Synchrotron.)

Cotton
continuous ion exchange with an endless belt of phosphorylated, 9: 3104(J)

Cottonwood Claims (Nev.)
geology and U occurrence, 9: 6963

Countercurrent separation processes
design and operation of a cell for preparative, 9: 120(J)
development of extraction columns, 9: 5933
effect of pulsation on, 9: 5300(J)
enrichment of N^{15} oxides by chemical exchange in thermal diffusion columns, 9: 5922(J)
symposium, 9: 4968(J)
testing of cloth ion exchangers for, 9: 6228(R)

Counting devices
(Electrical or mechanical devices for registering or recording numbers, not to be confused with radiation detection instruments which are often called counters; see also Radiation Detection Instruments; Radiation Detectors; Scalers.)
data from electric typewriter system for, 9: 5993(J)
fast counter circuits, use with scaler tubes, 9: 5995(J)

Counting devices (cont'd)
for measuring small C^{14} activities, 9: 7073(J)
Couples
(Specific couples are indexed with components arranged in both alphabetical and inverted orders.)
diffusion in, effects on cross section area, 9: 3526(J)
galling and seizing of, by friction coefficients, 9: 1269
Cove District (Ariz.)
geology, 9: 2262(R)
Crane Co., Chicago
progress reports on relaxation behavior of Ti alloys, 9: 1858(R), 3176(R), 5659(R), 7350
Creep
(See also appropriate subheadings under specific materials.)
absolute rate theory of, in cast Mg alloys, 9: 5057
of cadmium crystals, effects of α irradiation on, 9: 433(J)
under dynamic loads, theory, 9: 7402(J)
effects of structure on, at high temperatures, 9: 2732
grain-boundary displacement vs. grain deformation as rate determining factor in, 9: 6285
of internally oxidized copper alloys, testing, 9: 5367(J)
measurement of, in heat-resisting alloys, 9: 3504(R)
method for measuring, for reactor use, 9: 1120(J)
temperature effects on, 9: 5358
theory of, by vacancy condensation, 9: 4460
Critical assemblies
(See also Neutron sources; Reactors.)
size calculations, determination of lower bound, 9: 5194
size calculations, formula for upper bounds, 9: 5193
Criticality studies
critical Laplacian for infinite elliptical cylinders, calculation of, 9: 6808
determination of lower bound for critical mass, 9: 5194
formula for upper bounds for critical size, 9: 5193
Cross Mountain Quadrangle (Calif.)
geology, 9: 3154
Cross sections
(See also specific cross sections, e.g., Neutron scattering cross sections; see also appropriate subheadings under specific elements and isotopes.)
for collisions of helium, neon, and argon with argon, 9: 5802(J)
high-energy nucleon-nucleon, at cosmic-ray energies, 9: 5488(J)
interaction, for cosmic shower particles in emulsions, 9: 5984(J)
measurement with a collimated fission neutron source, 9: 7957
for photodetachment of electrons of H^- and D^-, 9: 5699(J)
photoionization of atoms, review of known data, 9: 5770(J)
for (p,n), (p,2n), (p,pn), and (p,2p) reactions at 100 Mev, calculation, 9: 4553(J)
relations between, derivation of, 9: 7969(J)
scattering, and scattered amplitude for obstacle in incident plane wave, relation between, 9: 7826(J)
stopping, of deuterons and protons in H_2, He, O_2, Ne, A, Kr, Xe, CH_4 and CO_2, 9: 5803(J)
theorem for systems of several identical particles, 9: 461(J)
for transitions in H and Na produced by electrons and protons, 9: 5794(J)
Crucibles
(See also crucibles identified with material, e.g., Aluminum oxide crucibles; see also appropriate subheadings under materials for which crucibles are used.)
design, for low-density foamed Al–Mg alloys, 9: 3182
Cryogenics
bibliography of recently published articles, 9: 1552
bibliography on effects of low temperature, 9: 7023
magnetic refrigerator for maintaining temperatures below 1°K, design and operation, 9: 1022(J)
Cryostats
at BNL reactor for irradiation of samples at liquid N_2 temperature, 9: 4622(J)
booster, for temperatures down to 0.74°K, 9: 2392(J)
for cyclotron irradiation at liquid He temperatures, 9: 7947(J)
design for magnetic susceptibility measurements, 9: 5382(R)
in-pile, design, 9: 5382(R)
Crystal detectors
(Radiation detectors operating on changes in electric conductivity; for complete instruments, see Radiation detection instruments (colorimetric); see also Chemical radiation detectors; Scintillation detectors.)
properties of Ge, for fast neutron flux measurements, 9: 1042
radiation probe using CdS crystal of high resolution and small size, for use with ionization chamber, design, 9: 1333(J)
Crystal Mountain District (Colo.)
occurrence of pegmatite deposits and geology, 9: 3157(J)
Crystal structure
continuously recording electron diffraction camera for studies of transitions in, 9: 1572(J)
direct determination of, by high-speed digital computers, 9: 2817(J)
effect on metallic properties, 9: 3908(J)
hexagonal lattice in titanium, 9: 6690(J)
imperfections in ionic crystals, lattice theory calculations, 9: 7419(J)
of metals and alloys, number of vacancies and energy of vacancy formation in, 9: 3525(J)
powder-pattern lines from crystals, effect of cold-work distortion on, 9: 6914(J)
symmetry centers in crystals, effect of atoms in fixed positions on, 9: 6915(J)
systematic absences corresponding to false symmetry in, 9: 7418
theory and thermodynamic basis, 9: 7299(J)
Crystallography
design of spectrometer for neutron-diffraction analysis, 9: 6382(J)
Crystals
(See also specific crystals, e.g., Copper crystals; Sodium iodide crystals.)
absorption spectra and electron energy levels, 9: 4393(J)
atomic scattering factors of, determination of, 9: 6691(J)
dispersion, reflection, and diffraction in, theory, 9: 7420(J)
distribution of x-ray intensities for, 9: 6915(J)
electric and optical properties, 9: 4737(J), 4836(J)
electrical properties, 9: 4835(J)
electron energy spectra in polar, 9: 4837(J)
electronic levels of atoms adsorbed on surface of, 9: 1930(J)
electrons trapped in ionic, thermal ionization of, 9: 7424(J)
ferromagnetic and antiferromagnetic, spin-wave treatment of neutron scattering by, 9: 5792(J)
ionic, excitons in, theory, 9: 5092(J)
lattice defects in, measurement by neutron scattering, 9: 6917(J)
lattices, quantum theory of, 9: 6553(J)
neutron total scattering cross sections, interference effects, 9: 2048(J)
polar, energy spectra of electrons in, 9: 4836(J)
potential and fields due to bounded array of charges, and application to, 9: 7823
powder patterns from cubic, correction for temperature-diffuse scattering in, 9: 5986

Crystals (cont'd)
production of high-crystallization temperature, in Verneuil furnace, 9: 1932(J)
quadrupole nuclear spin-lattice relation in, theory of, 9: 1012(J)
scatter of high-energy electrons in, 9: 2495(J)
single, of Si, Cu, In antimonide, and quartz, x-ray diffraction pattern, effects of radiation, 9: 2831
x-ray-diffraction, nomographs for determination of wavelength for highest angle in, 9: 7836(J)
x-ray scattering effects due to lattice defects, 9: 7835(J)

Cupferron complexes
of scandium, Y, La, Ce, Pr, Nd, Sm, and Gd, pyrolysis, 9: 5920(J)
of uranyl ions, preparation, crystal structure, and chemical reactions, 9: 6238

Curium
(See also Transplutonic elements; Transuranic elements.)
chelation with thenoyltrifluoroacetone, 9: 924(J)
separation and purification of, from the actinides and rare earths by ion exchange, 9: 7985(P)
spectrum, isotope shift and wavelengths of, 9: 5627

Curium isotopes Cm^{238}
production and separation, 9: 1443(P)

Curium isotopes Cm^{242}
conversion electron spectrum, 9: 4864
electron spectra, 9: 4705(R)
gamma spectra, 9: 7272(R)

Curium isotopes Cm^{243}
beta spectra, relative intensities of some K and L lines, 9: 6511
decay scheme, electron spectra, and delay-curve measurements, 9: 4705(R)
electron spectra, 9: 4705(R)

Curium isotopes Cm^{244}
conversion electron spectrum, 9: 4864
decay scheme, 9: 4705(R)
gamma spectra, 9: 7272(R)
spontaneous fission, neutron number and multiplicity distributions from, 9: 5308(J)
spontaneous fission of, average number of neutrons for, 9: 6073(J)

Curium isotopes Cm^{245}
gamma spectra, 9: 4705(R)
metastable states, 9: 7272(R)

Curium oxides
preparation and crystal structure, search for quadrivalent Cm, 9: 3802(J)

Current integrators
(See also Electrometers; Radiation detection instruments (ion current type).)
design for integrating ion beam from cyclotron, 9: 3574
design of, for Cockcroft-Walton accelerator, 9: 1654(J)

Current regulators
(See also Voltage regulators.)
for cyclotron magnet, modification, 9: 3575
for cyclotron magnets, design, 9: 3576
design and performance of electron-tube, 9: 3546
design for filament of mass spectrometer ion source, 9: 5408(J)
design for van de Graaff magnet, 9: 7559(J)
design of 100-amp d-c servostabilizer, 9: 1584(J)
for mass spectrometer ion sources, 9: 1031(J)
saturable reactor, design, 9: 5567(P)

Curtiss-Wright Corp. Wright Aeronautical Div., Wood-Ridge, N. J.
progress reports on heat treatment and evaluation of Ti alloys, 9: 4807(R)

Cutler Formation (Utah)
stratigraphy of, in Seven Mile Canyon Area, 9: 6964

Cutting tools
wear resistance, measurement with use of radioactive isotopes, 9: 7833

Cyanide ions
effect on $Tl^{+}-Tl^{3+}$ exchange rate, 9: 5594(J)

Cyanogen
combustion of, at high pressures, 9: 57(R)

Cybernetics
(See also Communication systems; Communication theory; Computers; Servomechanisms.)
image processing by electronic techniques, 9: 5717

Cyclic hydrocarbons
(See Aromatic compounds.)

Cyclobutene, hexafluoro-
vibrational spectra, 9: 2651(J)

Cyclohexane, 1,2-dichlorodecafluoro-
synthesis and reactions of, 9: 2189(J)

Cyclohexane, methyl-
synthesis of C^{14}-methyl-labeled, 9: 6630(J)

Cyclohexanol, 2-phenyl-
dehydration, products formed in, 9: 4703

Cyclohexanol–water systems
mass transfer in a horizontal liquid-liquid extraction tube, properties affecting the film coefficients of, 9: 2208

Cyclone separators
design and efficiency of an efferent vertical, for the separation of steam from water, 9: 7741(J)
liquid, application of, to mineral separations, 9: 4962(J)

Cyclopentadienyl compounds
mass spectra of V, Cr, Fe, Co, Ni, Re, and Rh, 9: 6220(J)
preparation of Mn, Fe, Co, and Ni, 9: 6937(J)
with scandium, Y, La, and Ce, and some rare earths, 9: 3096(J)
of vanadium, Mn, Fe, Co, Mo, and W, 9: 6936(J)

Cyclopropane
isomerization of tritium-labeled, kinetic isotope effect in, 9: 7440(J)

Cyclotrons
(See also Synchrocyclotrons.)
beam currents, absolute measurement, 9: 6777
beam focusing and scattering chamber modifications, 9: 7893(R)
beam position of Columbia 36-in., 9: 3965(R)
beams, LiF crystal technique for measuring energy of, 9: 5786(J)
beams, radiation-chemical studies with, 9: 2200(J)
break-up of negative ions in, 9: 4879(J)
Crocker 60-inch, index of available information, 9: 773
dee voltage phase control, servomechanism for, 9: 5991
design of three dee, 9: 6778
design of UCRL 60-in., 9: 3966(R)
electron, design and performance of 3-Mev X-band, 9: 5788(J)
electron model phase-compensated c-w, design and operation, 9: 5783
external beams, control device for, 9: 2924
focusing and analyzing system for 27-in. Rochester cyclotron, 9: 384
He^{3} circulation system, design, 9: 7404(J)
high-intensity ion source for, 9: 1587(J)
ion source for, design and performance, 9: 3662
irradiations with, at liquid He temperatures, crystal for use in, 9: 7947(J)

Cyclotrons (cont'd)
Liverpool, design and construction and beams from, 9: 6087(J)
mobile shielding for target removal from, 9: 810(J)
modifications in 184 in. and 60 in., 9: 2890(R)
nitrogen ion source for, 9: 7948(J)
orbital periods of electrons in microtrons, 9: 396(J)
phase-compensated constant-frequency, design and performance, 9: 6496
proton beam extraction from Liverpool, 9: 6497(J)
radiofrequency amplifier design using thyratron control, 9: 2925(J)
radiofrequency system of UCRL 184-in., 9: 3966(R)
radiofrequency system (3 phase) for cloverleaf, 9: 6495
resonant system for variable frequency, 9: 7945(J)
techniques for use of, in radiation damage studies, 9: 430(J)
variable energy, preliminary report on, of the Univ. of Rochester, 9: 1653
Cylinders
boundary value problems of thin walled circular, 9: 933(J)
break-away cavitation behind, mathematical analysis, 9: 3127(J)
buckling of, under axial compression, 9: 5942(J)
containing radioactive sources, surface dosage rates, 9: 3212
hollow, thermal stresses in, 9: 609
imperfectly absorbing, neutron density in non-scattering, 9: 3997(J)
mathematical analysis of, as radiation sources, 9: 779
metal, heat transfer in, mathematical analysis, 9: 5634
neutron capture and scattering analysis, 9: 346
self-shielding factors for long hollow, 9: 2517(J)
shell-like structures, bibliography of books and articles, 9: 3439
stresses caused by exponential temperature distribution, analysis, 9: 4117
surface radiation dosage determinations for, 9: 6729(J)
thermal rupture of, effects of shape on, 9: 1503(J)
thick-walled steel, overstrained by internal pressure, behavior, 9: 3453, 5059
Cyrano Reactor
(See Saclay Reactor.)
Cysteinamine
(See Ethanethiol, 2-amino-.)
Cysteine
effect of dietary, on gene action in Drosophila, 9: 3371(J)
protective action against radiation injuries, effects of high oxygen tension on, in rats, 9: 4667
protective action against x rays and nitrogen mustard, 9: 4358
protective effects of, against radiation damage to hematopoietic tissues in rats, 9: 6580(J)
protective effects of, against radiation effects on catalase, 9: 2199(J)
protective effects of, against radiation injuries, 9: 2061(J), 3015, 3035
Cystine
protective effects of, against radiation effects on catalase, 9: 2199(J)
solutions of, effects of x and ultraviolet radiation, 9: 5291(J)
Cytochrome C
effects of radiation on solutions of, 9: 6827(J)
Cytology
radiation-induced changes in, preparation of specimen for better evaluation of, 9: 5860(J)
Cytoplasm
effects of radiation on, in Habrobracon eggs, 9: 2573(J)

D

Daisy Fluorspar Mine (Nev.)
exploration, 9: 1260(J)
Dakota Mine (S. Dak.)
uranium distribution in, 9: 165(J)
Dakota Sandstone
stratigraphy, 9: 5327(J)
Dakota Sandstone (Ariz.)
geology, 9: 1828
Dakota Sandstone (Colo.)
geology of, in Horse Range Mesa Quadrangle, 9: 7775(J)
occurrence of anomalies in, 9: 7757
Daphnia
culturing P^{32}-labeled, 9: 3358(J)
Darby Mountains District (Alaska)
uranium distribution in, 9: 1523(J)
Dark Horse Claim (S. Dak.)
uranium distribution, 9: 165(J)
Data recording systems
(See also Magnetic recording systems.)
analysis, 9: 7846(J)
nuclear, in use at BNL, 9: 5993(J)
Datil Area (N. Mex.)
geology and geophysical exploration, 9: 2709
geology exploration, stratigraphy, and U-distribution, 9: 955(J)
David Sarnoff Research Center, Princeton, N. J.
progress reports on electronic devices for nuclear physics, 9: 1580(R), 1893(R), 3251(R), 6372(R), 7427(R)
progress reports on use of radioactive materials, 9: 3208(R)
Davis Mesa Quadrangle (Colo.)
preliminary geologic map of, 9: 4154(J)
Dawson Arkose Formation
geophysical exploration, 9: 7757
Deadwood Formation (S. Dak.)
geology of, 9: 165(J)
Decarboxylation
carbon isotope effect in, of malonic and in quinoline solution, 9: 6888(J)
Decontaminating solutions
effectiveness of, for cotton clothing, 9: 1704
Decontamination
(See also specific units and materials decontaminated, specific chemical processes, and special coatings used to aid decontamination.)
of cotton clothing, evaluation of laundering agents and techniques for, 9: 1704
lab-scale tumbler-type washing machine, 9: 6637
of porcelain enamel, 9: 617(J)
Decorah Mine (S. Dak.)
uranium and Th distribution, 9: 165(J)
Deer Creek District (Mont.)
exploration for U and Th deposits in, 9: 1520(J)
Deer Flat Area (Utah)
mineralogy, 9: 1829
Deer Lodge Claims (Nev.)
geology, 9: 6963
Defiance Uplift (Ariz.)
exploration, stratigraphy, and geology, 9: 1828
Degasification
by ionization, of vacuum systems, 9: 6352

Degasification (cont'd)
of liquids, equipment, 9: 2195

Deionization
in small air gaps prior to breakdown, 9: 7422(J)

Delay lines
(See also Mercury delay lines.)
miniature, design criteria, 9: 5095
synchronous and 20-μsec variable, development, 9: 4842(R)

Delayed neutrons
in circulating fuel reactors, diffusion, 9: 5493
effects on reactor kinetics, 9: 3642(J)

Delta Deposit (Utah)
mineralogy, 9: 4998

Delta rays
(See Electrons.)

Densitometers
for measuring densities of liquid metals at temperatures up to 1000°C, 9: 3386

Density
gradients, production of, in liquids by mechanical means, 9: 7847(J)
measurement in steel with radioisotopes, 9: 7805(J)

Denver. Univ. Denver Research Inst.
progress reports on development of chain-type polyphenyl compounds, 9: 6181(R)

Department of Mines and Technical Surveys. Mines Branch (Canada)
administrative progress reports, 9: 2260(R)

Dermatitis
(See Skin diseases.)

Desert Lake Quandrangle (Utah)
photogeologic map of, 9: 2270(J)

Detonation waves
(See also Explosions.)
equation of state, 9: 3214
relation between velocity and radius of curvature of, 9: 995(J)
velocity, measurement by microwave resonator techniques, 9: 4264

Deuterioörganic compounds
chemical reactions, review, 9: 3062(J)
decomposition kinetics of, review, 9: 5279

Deuterium
absorption in Ti, 9: 5280(R)
absorption reaction ($\pi^+ + d \rightarrow p + p$) at 76 and 94 Mev, cross sections, 9: 424(J)
cross sections and angular distributions for (d,t) and (d, He^3) reactions, 9: 792(J)
determination of, by isotopic gas analysis, 9: 2180(J)
distribution in isotopic exchange reactions of H, 9: 2649(J)
effects of, on metabolic oxidation in rats, 9: 6607(J)
electrolytic separation from H, temperature influence, 9: 4739(J)
exchange of acetic acid and, effects of nitro compounds, 9: 2182(J)
exchange of, between HF and hydrocarbons, 9: 3784
diffusion in Zr, 9: 244(J)
diffusion through Ni and design of leak for, 9: 1577(J)
electrolytic separation of, from H, effect of nitrate ion and NH_3 on, 9: 1594
gamma radiation from proton bombardment of, 9: 7942(J)
gamma reactions (γ,π), 9: 3966(R)
gamma reactions (γ,π^-), 250-Mev, 9: 6742(J), 7470(J)
gamma reactions ($\gamma,p\,\pi^-$), cross sections and energy distribution for 0 to 250 Mev, 9: 6012(J)

Deuterium (cont'd)
helium ion (He^3,p) reactions in energy range 100 to 800 kev, 9: 2451(J)
hyperfine structure, 9: 6437(R)
infrared emission spectra of molecular, between 1.15 and 1.97μ, 9: 2330(J)
isotopic abundance in meteorites, 9: 6338(J)
isotopic effect in Cannizzaro reaction, 9: 6208(J)
isotopic exchange in liquid DBr, and catalysis, 9: 6207(J)
isotope effects of, in reaction of Zn with water vapor, 9: 73(J)
isotopic exchange reactions, distribution coefficients, 9: 5281(J)
mass ratio of T and, 9: 2097(J)
mass spectrographic determination of, in H_2-D_2 mixtures, 9: 4386
mass spectrographic determination of, in hydrogen, 9: 3920
melting curves for, 9: 6746(J)
meson (π^-) interactions, total cross sections for 140 to 400 Mev, 9: 7077(J), 7881(J)
π-meson reactions in, 9: 5448
π-meson total cross sections, 9: 1111(J)
π^--meson scattering at 119-Mev, angular distribution, 9: 2488(J)
microdetermination in water, vapor-tension method, 9: 2645(J), 3780(J)
neutron total cross section measurements at high energies, 9: 4004(J)
neutron total cross sections, 9: 7124(J)
neutron total cross sections at 1.4 Bev, 9: 5486(J)
neutron total cross sections from 0.2 to 22 Mev, 9: 4557(J)
nuclear magnetic moment of, calculated by proton-neutron coupling, 9: 742(J)
photodisintegration cross section, 9: 3657(J)
π^+-photomeson production from, 9: 4859
photon reactions (γ,π), 9: 6450(J), 6736(J)
photoproduction (at 250 to 300 Mev) of π° mesons from, differential cross section for, 9: 6018(J)
photoproduction of π° mesons from, at 270 Mev, 9: 6019(J)
photoproduction (285 and 345 Mev) cross sections for mesons in, 9: 6017(J)
proton cross sections, 9: 2459
proton total cross sections, 9: 2458
proton total cross sections at 208 and 315 Mev, 9: 358(J)
quenching of resonance radiation of K by, 9: 238(J)
reduction of silver chloride by, 9: 3765
reduction of silver chlorides by, reaction mechanisms, 9: 3764
scattering of 192-Mev electrons by, 9: 4305(J)
solidified, compressibilities at low temperature, 9: 2824(J)
solubility in liquid N_2, estimation, 9: 5896(J)
thermal conductometric determination in partially deuterated boron hydrides, 9: 1203(J)
thermonuclear reactions of protons with, in stars, 9: 3647(J)
as tracer in studies of reaction mechanisms in organic compounds, 9: 6206(J)
triton reactions (t,α) at 1.5 Mev, 9: 4291(J)

Deuterium (liquid)
thermal conductivity of, from 19 to 26°K., 9: 889(J)
thermodynamic properties, 9: 6205

Deuterium compounds
properties of, bibliography on, 9: 7706
reaction kinetics, review, 9: 4738
vibrational energy of DCN, 9: 5897(J)

Deuterium hydrides
isotopic reactions with H_2O, 9: 861(J)
mass spectrographic determination of, in H_2-D_2 mixtures, 9: 4386

Deuterium–hydrogen systems
mass spectrographic determination of H_2, HD, and D_2 in, 9: 4386
radiation-induced and catalytic-induced equilibrium constants, 9: 4090(J)

Deuterium ions
(See also Deuterons.)
dissociation of molecular, in mass spectrometer, 9: 5417(J)
electron photodetachment cross sections of, 9: 5699(J)

Deuterium oxides
(See Water-d; Water-d_2.)

Deuterium–water systems
isotopic exchange, effect of γ radiation on, 9: 6222(J)

Deuteron beams
capture by various targets, 9: 5761(J)
energy, LiF crystal technique for measuring energy of, 9: 5786(J)
measurement of, from cyclotrons, 9: 6777

Deuteron cross sections
for capture by various targets, 9: 5761(J)

Deuterons
(See also Cosmic deuterons; Deuterium ions.)
angular distributions of inelastically scattered, 9: 2331(R)
attenuation of 190-Mev, by C, U, and Be, 9: 778
binding energy of, contribution of nonstatic forces to, 9: 4031(J)
bombardment of C targets by high-energy, production of neutrons in, 9: 1993(J)
breakup on H, T, He^3, and He^4, 9: 7159(J)
cross section for elastic scattering of 20.6-Mev protons, 9: 2470(J)
cross sections and angular distributions of tritons and He^3 from deuterium bombardment, 9: 792(J)
detection and measurement of, from photonuclear reactions, 9: 1037
detection by lithium fluoride, 9: 6868
deuteron reactions, branching ratio and cross sections, 9: 6492(J)
disintegration by electron bombardment, theory, 9: 2533(J)
elastic scattering by He, 9: 410(J)
elastic scattering of by heavy nuclei, 9: 7511(J)
elastic scattering of nucleons by, 9: 7978(J)
electromagnetic properties, 9: 7592(J)
energy loss by, in various gases, 9: 5803(J)
exchange scattering of 380-Mev neutrons on, 9: 3670(J), 4585(J)
fission of tungsten by 280-Mev, yields, 9: 7937(J)
formation of, from interaction of polarized protons, 9: 790(J)
high-energy d-d collisions, H^3 and He^3 production in, comparison, 9: 1659(J)
inactivation of poliomyelitis virus, 9: 3737(J)
interaction of, with carbon, 9: 795(J)
interaction of 30- to 300-Mev with nuclei, theory, 9: 7541(J)
interaction with neutrons, recoil deuterons and disintegration protons from, 9: 2939(J)
magnetic dipole and electric quadrupole moments of, meson corrections to, 9: 7971(J)
meson (π) scattering by, multiple-scattering corrections to the impulse approximation for, 9: 7080(J)
negative pions from neutron bombardment of, 9: 2914
neutron and proton scattering, 9: 2037(R)
neutron stripping in, 9: 7555(J)
nuclear magnetic and electric quadrupole moments, calculation with pseudoscalar meson theory, 9: 367(J)
nuclear reactions, angular momentum coupling in, 9: 5521(J)
nuclear reactions (d,p), numerical calculation of angular distributions, 9: 2095(J)

Deuterons (cont'd)
nuclear reactions (d,p), proton polarization in, 9: 1647(J)
nuclear reactions (d,p), Q values of, neutron binding energies from, 9: 737(J)
nuclear reactions (d,p) and (d,n), angular distributions, 9: 5504(J)
nuclear reactions (d,p) and (d,n), Coulomb corrections and numerical results, 9: 3658(J)
neutron scattering by, angular distributions, 9: 6504(J)
photodisintegration, 9: 4006(J), 4327(J), 7944(R)
photodisintegration at high energies, 9: 4873
photodisintegration at 2.615 Mev, 9: 1342(J)
photodisintegration by 95-Mev bremsstrahlung, 9: 4599(J)
photodisintegration of, by high-energy γ rays, 9: 2018(J)
photodisintegration of, sum rules for, 9: 3297(J)
pickup, from 95-mev protons on C, angular distribution, 9: 4307(J)
pickup from nuclei by high-energy polarized protons, 9: 4609(J)
polarizability, variation calculation of, 9: 4337(J)
production of, in n-p collisions, 9: 784(J)
production of N^{17} by bombardment of light elements with, 9: 4872
production of photo-, in sulfur, 9: 6054(J)
quadrupole moment of, mesonic corrections to, 9: 814(J)
range-energy and energy-momentum relations, tables, 9: 402
in reaction D(d,n)He^3, Q value of, 9: 6487(J)
scattering by He, Li^6 energy levels from, 9: 4592(J)
scattering by Mg and Be at 4.0 to 7.8 Mev, differential cross sections for, 9: 2944(J)
scattering cross sections in He from 0.28 to 4.62 Mev, and Li^6 resonance from, 9: 4591(J)
spallation of Cu by 280-Mev, yield and cross section, 9: 7938(J)
spallation of silver, by 280-Mev, cross sections and yields, 9: 7940(J)
spin polarization, 9: 4283(J)
stripping and pickup reactions as departure from j-j coupling shell model, 9: 5468(J)
stripping in $O^{16}(d,p)O^{17*}$ reaction, 9: 4894(J)
stripping of, measurement of nuclear radius from, 9: 1997(J)
stripping of high-energy, on targets of heavy nuclei, 9: 7520(J)
virtual level of, definition, 9: 3280(J)

Dewey Bridge Area (Utah)
geology and exploration, 9: 1256

Dextrose
(See Glucose.)

Diamond drilling
(See Rock drilling.)

Diamonds
(See also Carbon; Crystal detectors.)
x-ray scattering by, 9: 971(R)
x-ray scattering by, effects of radiation on, 9: 800(R)
x-ray scattering effects due to lattice defects, 9: 7835(J)

Diazo compounds
decomposition of mixed diazonium fluoroborates, 9: 4743(J)

Dielectric breakdown
(See also specific materials, instruments, etc.; see also Cables; Electric insulators.)
high-voltage, in vacuum, 9: 1935
high-voltage insulators and sparking problems, 9: 656

Dielectric constants
measurement, 9: 547

Dielectric films
bibliography on preparation and properties, 9: 4930

Dielectrics

(See also Electric insulators.)

aging characteristics and nondestructive testing, 9: 1553(R)

effects of radiation and repetitive voltage surges on, 9: 1554(R)

effects of radiation on, 9: 1553(R)

effects of varnish treatment on thermal aging characteristics of, 9: 1554(R)

fabrication of TiO_2, for linear accelerator wave guides, 9: 1096

thermal stability and nondestructive testing of, 9: 1554(R)

in 3 cm wavelength region, measurements of electrical and mechanical properties, 9: 3962

Dies

(See also Molds.)

design, effects of, on extrusion of Ti, 9: 6292

design of conical, for Ti alloy extrusion, 9: 2276(R)

Diet

(See also Food.)

containing meat from lethally irradiated animals, effects on dogs, 9: 5227(J)

effects of, on liver blood flow, tracer study, 9: 2609

effects of, on respiratory quotient in burros, 9: 2572(J)

vitamin C-free, effects on radiosensitivity of tumors in laboratory animals and man, 9: 3043(J)

Diethanolamine

(See Ethanol, 2,2-iminodi-.)

Differential equations

(See also Mathematics.)

asymptotic perturbations of, 9: 7446

reduction of second-order, according to their spectral functions, 9: 5421(J)

treating of linear ordinary differential systems of n^{th} order with, 9: 4240

Diffraction gratings

resolving power, 9: 2522(J)

Diffusers

conical, turbulent flow in, 9: 4774(J)

performance with rotating flow, 9: 4766

vaneless, performance of, effect of diameter, 9: 4767

Diffusion

(See also Bonding; Grain-boundary diffusion; Permeability Self-diffusion; Thermal diffusion.)

analysis of neutron, by electric circuit analog, 9: 3287

anisotropic diffusion lengths in diffusion theory, 9: 5514(J)

computation sub-routine for IBM 650, 9: 7065

effects on changes in cross section area of metallic cylinders welded to each other, 9: 3526(J)

instability considerations for difference equations derived from diffusion equation, 9: 4509

measurement in metals with radioisotopes, 9: 7802(J)

measurement of, use of electrolytic polishing for removal of layers of metals and alloys in, 9: 3874

measurement of surface, of metals, 9: 5658(R)

in metals, determination by β-emitting tracers, 9: 7795(J)

of metals and alloys, review, 9: 3206(J)

in metals, determination by β-emitting tracers, 9: 5670(J)

shear-cell and capillary methods for study of, in molten Pb–Bi systems, 9: 179

surface, of metals, interferometric method for measurement of, 9: 3455

surface, of metals, measurement, 9: 3845(R)

Diffusion (cont'd)

surface counting in, β absorption in thin layers of Ni, Al, and Co and relation to, 9: 4000(J)

in ternary metallic systems, measurements and theory, 9: 4214(J)

theory of steady-state, 9: 969

tracer techniques in measuring, in solids, 9: 7374(J)

Diffusion pumps

(See also Vacuum pumps.)

mercury, design of Ryerson, 9: 7325

Digestive tract

(See Gastrointestinal tract.)

Diketone chelates

with Cu^{2+}, spectra and structure of, effect of F substitution on, 9: 6219

Diketones

(See also Ketones.)

absorption spectra of uranyl complexes with, 9: 135(J)

polymerization, effect of reaction time on, 9: 6218(R)

preparation, spectra, and ionization constants of diaroylmethanes, 9: 2133

preparation, spectra, and structure, 9: 6219

spectra, 9: 7675

Dilatometers

design, calibration, operation, and limitations of, for determination of room temperature thermal expansion coefficients, 9: 6704

Dilatometry

alpha–sigma transformations and dilatation-temperature curves, 9: 3537(J)

Dimethylamine

direct fluorination, 9: 890

Dioxane

solution with water, determination of pKd values and stability constants of, 9: 869(J)

Dipeptides

(See Peptides.)

Dipyridyl

(See Bipyridines.)

Disasters

(See also specific reactors; see also Reactor safety.)

monitoring in, with photographic film, 9: 6412(J)

Diseases

(See also diseases by type, e.g., Blood diseases; Skin diseases.)

biological effects and medical application of Co^{60} in, 9: 7644(J)

Disks

solid angle calculations, 9: 7853

thermal shock resistance of brittle, theory, 9: 142

Dissociation

energy of gaseous compounds, table, 9: 2437

Dissolution

absolute rates of, effects of flow conditions on, 9: 3448(J)

Distillation

(See also Evaporation.)

fractional, theory, 9: 3797

of materials in precision distillation columns, mathematical analysis, 9: 3429(J)

Distillation apparatus

(See also Column packing; Evaporators; Packed columns.)

design and performance of, for separation of hexone from aqueous solution of U, 9: 533

precision, separation of materials in, mathematical analysis, 9: 3429(J)

Distillation Products Industries, Rochester, N. Y.

progress reports on colorimetric and conductimetric dosimeters, 9: 4241(R), 4242(R)

Dithizone
solutions of, radiolysis, 9: 4751(J)
Dithizone, polonium derivatives
chemical composition, determination, 9: 4069(J)
Dodecylamine acetate
adsorption on hematite and quartz, surface tension, and wetting of hematite and quartz by, 9: 1486
Dogs
lethal dosage determination of radiation for, 9: 1720
lethal effects of radiation, 9: 2567(J)
thyroid uptake of iodine in, effect of diet, hypophsectomy, and TSH on, tracer study, 9: 6175(J)
Dolomites
thermal conductivity and thermal diffusion, 9: 1283
Doty Claim (Calif.)
radioactive minerals in, 9: 3837(J)
Dow Chemical Co. Metallurgical Labs., Midland, Mich.
progress reports, 9: 3840(R)
progress reports on effect of rare earth additions on high-temperature properties of Mg, 9: 5050, 5342
progress reports on fabrication and properties of Mg alloys, 9: 1852(R)
progress reports on high-strength Mo alloys, 9: 4160(R)
progress reports on natural and synthetic films on magnesium and its alloys, 9: 5051(R)
progress reports on principles of the effect of rare earth additions on the high-temperature properties of Mg, 9: 4161(R)
progress reports on powder fabricated Mg alloys, 9: 5652(R)
Dow Chemical Co. Western Div., Pittsburg, Calif.
progress reports, 9: 6942
Dow Corning Corp., Midland, Mich.
progress reports on fluorine-containing polyethers, 9: 1767(R), 7709(R)
Drawing
measurement of forces involved in, 9: 6992
Dripping Springs Area (Utah)
mineralogy, 9: 1829
Drops
evaporation of spherical liquid, in a current of gas, 9: 1015(J)
movement on a solid, kinetic and thermodynamic study, 9: 3210
separation of ions or groups of ions in, 9: 1786
Drosophila
bristles, effects of radiation on, 9: 2585(J)
effects of high and low intensity x radiation on, comparison, 9: 3029(J)
genetic effects of exposure to fast neutrons, 9: 4916(J)
natural populations of, genetic factors, 9: 5(R)
radioinduced mutagenesis in, 9: 7235(J)
radioinduced mutations in, 9: 30(J), 3731(J)
radioinduced mutations in, comparison of effects of fast neutrons and x radiation, 9: 824(J)
synthetic lethals in, 9: 7606
Drugs
(See also Analgesics; Anesthetics.)
biological effects of, compared with effects of radiation, 9: 3008
effect of chlorpromazine on cardiac arrhythmias induced by intracerebral injection of tryptamine-strophanthidin in dogs, 9: 3005
radiomimetic, effects on body weight and blood picture of rats compared with effects of whole-body x irradiation, 9: 3013(J)
sterilization by high-energy electrons, 9: 2053(J)
Dry boxes
argon atmospheres, apparatus for testing, 9: 3776
for handling phosphors, design, 9: 4401(J)
Dry boxes (cont'd)
plastic sealer for use with, 9: 565(J)
sectional, design and construction, 9: 5284
Ductility
(See also appropriate subheadings under specific materials.)
of high-temperature alloys, device for testing and results, 9: 4197(J)
of metals, new criterion for, 9: 1867(J)
Duke Univ., Durham, N. C.
progress reports of Microwave Lab., 9: 1134(R)
progress reports on radiofrequency spectroscopy, 9: 4332(R)
Dunkard Group (W. Va.)
stratigraphy and occurrence of radioactive coal and shale in, 9: 6268
Dust hazards
maximum allowable concentrations of poisonous gases, vapors, and dusts in USSR industrial establishments, 9: 4687(J)
Dusts
(See also Aerosols; Particles; Powders.)
in air, spectrographic determination of Be in, 9: 122(J)
beryllium, radiometric detection of, equipment, 9: 5076
beryllium, radiometric determination of, in air, 9: 5720(R)
design and performance of scrubbers for wet, from gas streams, 9: 3091(J)
maximum allowable concentrations in USSR industrial establishments, 9: 4687(J)
monitoring of toxic, 9: 1913(J)
properties, measurement, and control of industrial, book, 9: 3808(J)
radioactive, lung deposition and clearance, tracer study, 9: 5875(J)
radioactive, sampling of, design of collector for, 9: 1798(R), 1799(R), 1800(R), 1801(R)
sampler for radioactive, 9: 1802(R)
sampling equipment, evaluation, 9: 935
sampling of, for dust-content measurements, influence of dust dynamics, 9: 2358(J)
suspended, charging of, theory, 9: 3557(J)
of uranium oxides, effects of particle size on toxicity following inhalation by animals, 9: 1731(J)
Dyes
(See also specific dyes.)
interaction with hair fibers, tracer study, 9: 922(J)
pulmonary absorption of, in rats and dogs, 9: 3360
Dysprosium
chromatographic separation from La, 9: 6906(J)
determination in Zr, 9: 5890(J)
heat of sublimation, 9: 1994(R)
polarographic studies, 9: 5602(J)
spectrographic analysis of, for Ho, Er, Y, and Tb, 9: 5272(J)
spectrographic determination of, in Ho and Er, 9: 5272(J)
tissue distribution of, in rats, tracer study, 9: 2551(R)
Dysprosium chlorides
crystal structure, 9: 544(J)
Dysprosium isotopes Dy^{166}
energy levels, 9: 1405(J)
Dysprosium nitrates
solvent partition of, between nitric acid and tributyl phosphate, 9: 901

E

Early Day Claim
assay of samples from, 9: 1257
Early Day Claims (Nev.)
geology and U occurrence, 9: 6963

Earth

(Restricted to studies of the planet or portions of its crust as such; see also Soils.)

absorption of cosmic radiation underground, 9: 1293(J)

abundance of chemical elements in crust of, 9: 1830(J)

age calculations by isotopic composition of Pb in earth and meteorites, 9: 1835(J)

age of, from K content of crushed rocks and A content of atmosphere, 9: 7763(J)

radioactive decay in, effect on temperature gradients, 9: 2796(J)

thermal conductivity of, effect on temperature gradients, 9: 2796(J)

East Walker River Area (Nev.)

exploration, geology, and U distribution, 9: 1516(J)

geology, mineralogy and U occurrence, 9: 6963

uranium distribution, 9: 1260(J)

Echo Cliffs Area (Ariz.)

mineral determinations in U deposits and prospects in, 9: 5948(R)

Edgemont District (S. Dak.)

map showing uranium deposits, distribution and occurrences in part of, 9: 7341(J)

Edisto Island Area (S. C.)

geophysical exploration, map of, 9: 1833(J)

Egg yolks

analysis of proteins in, of frog eggs, 9: 6899

Eggs

(See also Embryos.)

of Ascaris, effects of irradiation survival and cleavage, effects of temperature, 9: 2571(J)

developing, radiosensitivity of, 9: 3(R)

development of embryos of frogs, effects of x irradiation of on, 9: 820

development of Habrobracon, effects of x radiation and nitrogen mustard on, 9: 3024(J)

of Habrobracon, effects of radiation on cytoplasm, 9: 2573(J)

metabolism in, effects of radiation on, in grasshoppers, 9: 495(J)

ovulation and fertilization in frog, gamma radiation effects on, 9: 2581(J)

radiosensitivity of, of Habrobracon, 9: 7634(J)

x-ray induced mutations in, effects of oxygen on frequency of, of Habrobracon, 9: 2592(J)

yolks of, effects of radiation, 9: 2547(R)

Egnar Quadrangle (Colo.)

mineral investigations field studies map of, 9: 4152(J)

Einsteinium

(See also Transplutonic elements; Transuranic elements.)

chelation with thenoyltrifluoroacetone, 9: 924(J)

discovery and nuclear properties, 9: 7143(J)

Einsteinium isotopes

disintegration, 9: 4976

Einsteinium isotopes E^{253}

decay schemes, 9: 4705(R)

decay schemes and nuclear spectra, 9: 4863

Einsteinium isotopes E^{254}

decay schemes and nuclear spectra, 9: 4863

isomeric states of, and electron capture in, 9: 6061(J)

Elasticity

design of an electrostatic apparatus for dynamic elastic moduli determinations of Ti alloys, 9: 2293(R)

Elastomers

(See also Rubber.)

fluorinated polymers, preparation and properties, 9: 1487(R)

mechanical properties of, literature survey, 9: 3452

Elastomers (cont'd)

preparation of fluorine-containing alkyl silanes for, 9: 5898(R)

preparation of fluoroörganic silanes as, 9: 4952

properties and synthesis, 9: 6210(R)

radiation effects, 9: 1550(R), 7569(J)

synthesis and physical properties, 9: 4953

synthesis and polymerization of monomeric materials, 9: 4707

synthesis and properties of, from fluoroörganic compounds, 9: 6188(

synthesis and properties of fluorinated polydienes and polyacrylates, 9: 3083(R)

tensile and electrical properties, effects of β and γ radiation on, 9: 7722

vulcanization with γ radiation, 9: 4961

Eldorado Claims

assay of samples from, 9: 1257

Electric arc furnaces

for casting Ti and Ti alloys, design, 9: 3847

design of, for melting Zr, 9: 6660

employing silicon carbide rods, design, 9: 7342

vacuum, for testing scaling of Ti and Ti alloys, 9: 6263(R)

Electric arcs

thermal, of high temperatures and low operating voltage, 9: 5094

Electric conductivity

(Including resistivity; see also Resistors.)

cell for measuring, design, 9: 4749(J)

design and performance of instrument for the recording of isothermal electrical resistance recovery, 9: 3914

induced in MgO crystals by electron bombardment, 9: 6796(J)

measurement of high resistances, equipment and methods for, 9: 3880

of metals at high temperatures, theory and design and performance of equipment for measurement, 9: 1502

method of measuring hi-meg resistors, 9: 2827

methods of measurement, 9: 974, 4462

theory of, of fused salts, 9: 2139(J)

Electric control systems

approximate solution of limited motion movements in non-linear, 9: 6712(J)

frequency-response method applied to automatic-feedback, bibliograph 9: 287(J)

friction in, locus curve method for stability investigation of, 9: 6716(J

for vacuum pumps, design, 9: 3243(J)

Electric discharge

(See also Electric arcs; Glow discharges.)

in air, investigation of delay time, 9: 7421(J)

basic data, 9: 1304

breakdown of small air gaps, 9: 7422(J)

breakdown processes in N_2, O_2, and mixtures, 9: 2377(J)

characteristics of cloud in arc, 9: 6358(J)

chemical reactions induced in, pressure dependence of, 9: 5987(R)

concentration of metastable atoms in positive column of a low-pressure 9: 7837(J)

conditions for striking and maintaining, in gases on a-c current at audio frequencies, 9: 7045(J)

departure from Pachen's Law of, in gases, 9: 2376(J)

diffusion of plasma electrons and ions across magnetic fields, 9: 4497(J)

electron speed distribution in positive column of, 9: 6359(J)

in gases, incandescent-cathode vacuum, 9: 7047(J)

in gases, oscillographic method of studying, 9: 5093(J)

in gases, theory of spherical probes, 9: 4225(J)

high-frequency, in low-pressure gases, 9: 3567(J)

Electric discharge (cont'd)
magnetization of classical electron gases, kinetics of, 9: 5399(J)
metal erosion by spark, 9: 6357(J)
metal transfer between electrodes in a high vacuum upon application of electric field, 9: 6696(J)
normal atom concentration in positive column of, 9: 6360(J)
patterns of voltage and current at the moment of, 9: 7422(J)
shock wave detection by, in gases at less than 5 mm Hg, 9: 6383(J)
spark, gas temperature and ionization in, and spectral lines of, 9: 6356(J)
spark, generator circuits for, and analysis of conditions within, 9: 6361(J)
spark, in uniform fields, complete discussion of, 9: 6353
sparking in Hg vapor, 9: 6693(J)
spectrum excitation by, 9: 6355(J)
Electric fields
effect on energy spectrum of electrons in semiconductors, 9: 7048(J)
influence of alternating, on light emission of ZnS and ZnS:CdS phosphors, 9: 7075(J)
metal transfer between electrodes in high vacuum on applications of, 9: 6696(J)
plasma oscillations in constant, dispersion equations for, 9: 6694(J)
polaron semiconductor in presence of, 9: 7395(J)
potentials and fields from bounded array of charges, 9: 7823
spark breakdown in uniform, 9: 6353
theory of probes in electronegative gases, 9: 7046(J)
theory of transport equations in strong, 9: 6810(J)
Electric generators
(See also Pulse generators (electronics).)
radioactive, design, 9: 1440(P)
Electric insulators
(See also Dielectrics.)
aging characteristics and nondestructive testing, 9: 1553(R)
clamping device for, used over wide temperature ranges or in magnetic fields, 9: 5551(P)
corrosion in NaK at 250 to 300°F, 9: 4179(R)
design of high-voltage bushing, 9: 1433(P)
effects of high neutron flux on, 9: 429
effects of radiation and repetitive voltage surges on, 9: 1554(R)
effects of radiation on, 9: 1553(R), 3208(R)
effects of varnish treatment on thermal aging characteristics of, 9: 1554(R)
electric losses in metal-ceramic seals, 9: 2786
insulation resistance of, for wafer switches, 9: 4821
performance for high voltages, 9: 656
performance of compressed gases and vacuums as, 9: 1368
thermal stability and nondestructive testing of, 9: 1554(R)
Electric moments
(See also Nuclear electric moments.)
of deuterons, meson correction to, 9: 7971(J)
Electric potential
polarization parameters, inclusion of, in mathematical analysis of galvanic corrosion, 9: 1824
precision high-voltage attenuator with good frequency response, 9: 4207
recording devices for, design, 9: 2386
sparking, in mercury vapor, 9: 6693(J)
Electric power
economic aspects of production of, in selected countries, 9: 7603
from separated fission products, survey of methods for, 9: 3716(J)
transient load stability, calculations, 9: 7821
Electric probes
in gas discharges, theory, 9: 4225(J)
Electric probes (cont'd)
theory of, in electronegative gases, 9: 7046(J)
Electric resistance
(See Electric conductivity.)
Electric resistors
(See Resistors.)
Electric switchgear
design, 9: 1439(P), 8001(P)
design for electronic power switch, 9: 6708
insulation resistance of wafer switches, 9: 4821
Electric transients
load stability of electric power systems, calculations of, 9: 7821
Electrical Engineering Research Lab., Engineering Experiment Station, Univ. of Ill.
(See Illinois. Univ., Urbana. Electrical Engineering Research Lab.)
Electricity
precision measurements, 9: 5088(J)
Electrocardiography
(See Cardiography.)
Electrochemical analysis
(See also Polarography.)
of HCl solutions containing Po, apparatus for, 9: 3757
Electrochemical corrosion
average current density calculation, 9: 3823
effect of polarization and liquid thickness on total corrosion current in, mathematical analysis, 9: 155
effects of insulator between coplaner electrodes on, mathematical analysis, 9: 1823
geometric factors in electrical measurements relating to, and its prevention, 9: 3152(J)
mathematical analysis, 9: 619, 620, 5322(J)
polarization parameters, incorporation into potential functions in, mathematical analysis, 9: 1824
potentiostat for study of, design, 9: 157(J)
using semi-infinite coplanar electrodes with equal constant polarization parameters, mathematical analysis, 9: 152
Electrochemistry
applications of, to investigations in corrosion, 9: 6648(J)
electrolytic current flow by bubble migration, 9: 230
of metals in molten salts, 9: 522(J)
of molten salts, neutral sodium electrodes for, 9: 4932(J)
thermodynamic criteria for kinetic equations of electrochemical reactions, 9: 4710(J)
Electrochromatography
(See also Chromatography.)
electrical mobility of phosphate ions in paper, 9: 1222(J)
electroösmosis in paper, with electrode vessels, 9: 1220(J)
electroösmosis of lactic acid solutions in paper electrochromatography with electrodes on paper, 9: 1221(J)
paper, effect of concentration and sorption on migration of cations in, 9: 4106(J)
Electrodeposition
(See also appropriate subheadings under materials deposited.)
of suspended dust particles on wire, mathematical analysis, 9: 3557(J)
Electrodes
(See also electrodes as identified by material, e.g., Mercury electrodes; see also Cathodes.)
activity measurements of Ca, Mg, Na, and K ions in electrolytic solutions with resin membrane, 9: 2149(J)
anion activity measurements of chloride, sulfate, and La ions with resin membrane, 9: 2150(J)
clamping device for, used over wide temperature ranges or in magnetic fields, 9: 5551(P)

Electrodes (cont'd)
for condenser impulse welding, design and performance of, 9: 641
high-temperature, performance of Ag, AgCl and Hg, HgCl combinations as, 9: 2623(J)
influence of, on arc discharge spectra, 9: 6358(J)
for nuclear batteries, design, 9: 3548(R), 3549(R), 3550(R)
operating characteristics of different waterproofing coatings on, in underwater metallic arc welding, 9: 2316(J)
polarographic, employing controlled stirring, 9: 5412(J)
rotating disc, for spectrochemical determination of Mg and Be, design, 9: 7701(J)

Electrolysis
electrolytic current flow by bubble migration, 9: 230
preparation of metals, alloys, and metallic compounds from fused salts by, 9: 2744(J)
separation of Eu from Sm by, 9: 4407(J)

Electrolytes
aqueous, nuclear magnetic resonance, 9: 5084(J)
concentration of Na and K in serum, effects of total-body irradiation on, in hamsters, 9: 489(J)
diffusion coefficients of $CaCl_2$ and $SrCl_2$ in aqueous solutions, 9: 7268
metabolism in yeast, effect of cell surface, tracer study, 9: 4692
molten salt, neutral sodium electrode with zero potential for electrochemical studies, 9: 4932(J)
for polarographic determination of U, 9: 1149(J)
for polarographic determination of U in presence of other ions, 9: 1150(J)

Electrolytic cells
design and operation using non-aqueous electrolytes, 9: 7674
design for deposition of Ti, 9: 6291
design of, for precipitation of U and V, 9: 7728
efficiency for electrolysis of iron silicate slags, 9: 5642(J)
electrochemical behavior of Ti/fused salt/Pt, 9: 3067(J)
electromotive force of D_2, DCl, AgCl, Ag and D_2 NaOD + NaCl, AgCl, Ag, 9: 3078(J)
electromotive force of, involving pellets of a solid solution of CaO in ZrO_2 as electrolyte, 9: 3177(R)
miniature, for the preparation of small quantities of alkali metals, design, 9: 921(J)
preparation and performance of, containing $Mg/LiNO_3 \cdot KCl \cdot K_2CrO_4/Ag$, 9: 853

Electrolytic polishing
equipment for, 9: 2328(J)
use of, for removing layers of metals and alloys, determination of diffusion coefficients by, 9: 3874

Electromagnetic fields
analytic determination in air gap of CERN synchrotron, 9: 388
geophysical prospecting with, theory of, 9: 1258(J)
interaction of system of particles with, expression for, 9: 6809(J)
interaction with charged particles, theory, 9: 4025
interaction with free electrons, quantum effects in, 9: 7216(J)
measurement by nuclear resonance, 9: 1327(J)
measurement for CERN synchrotron, 9: 1367
photon production by coupling to elementary particles, 9: 6132
of proton synchrotrons, compensation windings in, 9: 7557
radiative effects in constant, avoiding of infrared divergencies in, 9: 464(J)
theory of multipole, 9: 5199(J)

Electromagnetic flowmeters
(See Flowmeters.)

Electromagnetic pumps
bibliography, 9: 4761
for circulating Mg–Th alloy at 1000°C, design, 9: 931
design, performance, temperature factors, and testing, 9: 7748
design and performance of, for liquid metal systems, 9: 6999(R)
design and performance of 400-gpm, 3-phase flat linear, for low line pressures, 9: 3815
efficiency, 9: 5657(R)
efficiency of, in reactor cooling systems, 9: 4175(R)
for liquid reactor coolants, tabulation, 9: 7534(J)
performance with liquid Na or NaK alloys, 9: 4179(R)
thermoelectric, theory and engineering applications, 9: 6643

Electromagnetic separation
(See also Calutrons; Mass spectrography; Mass spectrometers.)
apparatus and collection of gaseous isotopes, 9: 3247
design of a calutron, 9: 7998(P)

Electromagnetic Separation Plant
(See also Calutrons.)
electrical system, 9: 656
manual of vacuum systems and techniques, 9: 145

Electromagnetic waves
focusing of charged particle beams by TM_{01} waves, 9: 726
hydromagnetic, acceleration of cosmic rays by, 9: 5983(J)
power flow in coaxial lines, measurement, 9: 7054
propagation in ionized gases, 9: 6681
scattering by nucleons, classical treatment of, 9: 4618(J)
scattering of, from randomly uneven surface, 9: 1284(J)
theory of propagation of pure electric and magnetic waves in cylindrical systems, 9: 6335

Electromagnetism
vacuum polarization in classical, 9: 4826(J)

Electromagnets
(See Magnets.)

Electrometallurgy
(See also Electrochemistry.)
electroforming of funnels, tubes, and trumpets of various metals, performance of liquid baths in, 9: 3495

Electrometers
(See also Electron tubes; Radiation detection instruments (ion current type).)
calibration, 9: 3924
differential, to measure modulated output current of ion chamber, 9: 1942

Electron beams
application of intense, for excitation of gases, design and performance of apparatus for, 9: 2477(J)
from betatrons, therapeutic applications, 9: 1724(J)
Cherenkov radiation from, 9: 3568(J)
dynamic pressure stage elements for projection of intense monokinetic, into gases at high pressure, design and performance of equipment, 9: 2475(J)
effects of exposure to, on latent period in bacteriophage, 9: 2570(J)
effect of space charge on, in a constant electrostatic field, 9: 5168(J)
electrostatic focusing with periodic fields, 9: 264(J)
focusing, use in analysis of metals and alloys structure, 9: 5992
focusing in alternating-gradient channel using permanent bar magnets, 9: 395
magnetic focusing, field calculations, 9: 5403(J)
magnetically focused, positive ion drainage in, 9: 7406(J)
measurement of gas density with, 9: 1940(J)
noise in, theory of, 9: 7025(R)
optical systems with rectilinear axes without rotational symmetry, 9: 2378(J)
plasma oscillations, 9: 7034(J)

Electron beams (cont'd)
power flow in, theory, 9: 7035(J)
relativistic, aberration, 9: 2380(J)
relativistic, electrostatic deflection, 9: 2379(J)
space charge effects, review, 9: 6780(J)
used for determination of density profiles in shock waves, 9: 5988(J)
Electron cameras
specimen chamber design for, 9: 690(J)
Electron capture
angular correlations in, 9: 3330
autoionization effects, 9: 6465(J)
in decay of Na^{22}, 9: 6697(J)
gamma spectrum associated with, calculation of shape of, 9: 6466(J)
of krypton Kr^{79} for K and L electrons, 9: 7426(J)
L to K branching ratio in A^{37}, 9: 6455(J)
probability of, influence of finite nuclear extension on, 9: 2088(J)
theoretical results, 9: 2991
Electron-diffraction analysis
continuously recording electron diffraction camera for studies of crystal structure transitions, 9: 1572(J)
simultaneous use with x-ray spectroscopy, 9: 4905(J)
Electron microscopes
application of, to mineralogic studies, design and performance, 9: 3830(J)
calibration, 9: 1133
conversion of transmission, into emission, 9: 275(J)
design and performance, for use in constitutional metallurgy, 9: 2327(J)
for field-emission microscopy of metals, design, 9: 2741
reflection, design, construction, and performance, 9: 3579(J)
reflection-transmission stage for, design and construction, 9: 3580(J)
specimen grid for, design, 9: 3(R)
theory of image formation, 9: 4232(J)
Electron microscopy
of copper fluorides, 9: 6916(J)
high-resolution evaporated-carbon replica technique for, 9: 2395(J)
inspection of selected areas of surfaces by, using replicas, 9: 247(J)
preparation of elastic tissue elements, 9: 1707(J)
reflection, examination of oxide films by, 9: 3536(J)
sample preparation, 9: 4911(R)
use in constitutional metallurgy, 9: 2327(J)
Electron multiplier tubes
(See also Photomultiplier tubes.)
application of photoelectric cells to, 9: 1617(J)
quantitative detection of positive ions by Allen-type, 9: 1051(J)
Electron pairs
coincidence circuit for detection of, and application to study of O^{16}, 9: 7465(J)
emission of, in magnetic fields, 9: 414(J)
high-energy, produced in nuclear emulsion by 113-Mev positive pion, 9: 1664(J)
measurement of energy loss of, in γ-ray scintillation counter, 9: 1053(J)
from monopole transition of O^{16}, angular correlation of, 9: 6365(J)
of oxygen (O^{16}), angular correlation and energy spectrum of, 9: 7909(J)
production of cosmic, by high-energy photons, 9: 2813(J)
production of electron tridents between 0.1 and 10 bev, 9: 1631(J)
trident process for, mean free path for, 9: 1927(J)
Electron scattering cross sections
effects of electron mass on high-energy, 9: 6794(J)
Electron showers
total energy of, estimate by scintillating sheets in γ-ray counter, 9: 1053(J)
number and energy distribution of, produced by electrons, 9: 3561(J)
Electron sources
(See also Beta sources.)
design of, 9: 1610(J)
design of secondary filament in a calutron, 9: 8020(P)
Electron spectrometers
theory, construction, and performance, 9: 3696
Electron tubes
(See also Electron multiplier tubes.)
design and performance of current-regulating, 9: 3546
design and performance of five-stage r-f, for mass spectrometer, 9: 1579(R)
design and performance of one-stage r-f, for mass spectrometer, 9: 1578(R)
harmonic generation in magnetrons, 9: 6437(R)
life of, in radiation detection instruments, 9: 1329(J)
longitudinal beam amplifiers, minimum noise figure derivation, 9: 4210(R)
magnetron design and development, 9: 731(R)
positive ion drainage in, 9: 7406(J)
theory of microwave beam amplifiers, 9: 652(R)
Electronic equipment
in automatic direct reading spectrometers, 9: 3948(J)
circuit techniques, recent developments in, 9: 7449
component failures at Harwell, detailed study, 9: 3912
cosmic meson decay detected by, 9: 7477(J)
for creep testing, automatic data recording, and magnetic flux measurement, development, 9: 4842(R)
design and operation, 9: 7872(J)
design for electronic power switch, 9: 6708
design for short-resolving-time pulse discriminator, 9: 7056
eddy-current bridge to measure skin losses, design, 9: 4499
field failure reports and quality control, 9: 1
flip-flop circuits for high-speed computers, 9: 5413(J)
for miniature pulse integrator suitable for airborne conditions, designs for, 9: 6403
multiplier for HRE simulator, circuit for, 9: 371
paramagnetic resonance measurement, design, 9: 5382(R)
pulse height analyzer modifications, 9: 7864(J)
pulse sorter, design of 24-channel portable, 9: 6719(J)
pulsed photomultipliers for fast scintillation counting, 9: 6092
resistance welding controls, 9: 2833(J)
scaling circuits, methods of measurement of resolving time of, 9: 5994(J)
for servomechanism giving cyclotron dee voltage phase control, 9: 5991
for stabilization of magnetic fields, use of transistors in, 9: 6376
theoretical analysis of possible failure, 9: 5075
voltage calibration system for pulse-height measurement, 9: 5406
x-ray microprobe, in analysis of metals and alloys, 9: 5992
Electronics
(See also Circuits; Computers.)
bibliography of physical, 9: 2353(J)
millimicrosecond pulse techniques, 9: 2349(J)
switch mechanism for electric circuits, 9: 8001(P)

Electrons

(See also Auger electrons; Conversion electrons; Cosmic electrons; Peptons; Positrons.)

absorption and transmission in elements of high atomic number, 100 to 150 kev, 9: 6367(J)

absorption of, in Cu and Cd, 9: 415(J)

absorption of monoergic, in Al, 9: 791(J)

absorption processes, accelerator and high-resolution analyzer for, 9: 3665(J)

acceleration in constant electrostatic field, effects of space charge on, 9: 5168(J)

acceleration of, in high-energy linear accelerators, cost factors and design, 9: 772

angular correlation with neutrinos in β decay of Ne^{19}, 9: 2059(J)

angular distribution in electron-photon showers, 9: 7425(J)

associated with π-μ decay, 9: 7091(J)

atomic, effect of, on angular correlation of Ni^{60} γ rays, in relation to nuclear orientation, 9: 6471(J)

atomic, influence on angular correlation of successive nuclear radiations, 9: 6468(J)

atomic, probability of emission due to β and α decay, 9: 6532(J)

backscattering from Mg, C, Be, and Li, 9: 2041(J)

backscattering of, in spectrometers and counters, 9: 684(J)

behavior in ionic crystals, theoretical analysis, 9: 4906(J)

bipartition angles for Compton scattering by, 9: 6698(J)

bremsstrahlung spectrum of 1.0- to 1.40-Mev, for thick targets, 9: 1307(J)

capture and loss of, by moving ions in dense media, 9: 1563(J)

capture of, from H atoms by fast protons and from H atoms by He ions, 9: 1287(J)

cathode emission and scattering in neon, 9: 7025(R)

classical theory of, and introduction of fundamental length, 9: 1013(J)

from cobalt (Co^{60}) γ-rays, energy distribution, 9: 6418(J)

Compton scattering of a circularly polarized quantum by, with given spin direction, 9: 2035(J)

conductivity in ionic crystals, theory, 9: 5092(J)

Coulomb scattering of high-energy, by nuclei, 9: 3671(J)

cross sections for capture and loss by 26-Mev nitrogen ions, 9: 5809(J)

current of, probe in a plasma, 9: 7049(J)

density determination of, at given distance from probe in plasma, 9: 7049(J)

diffraction, theory of interferometer using, 9: 1024(J)

diffraction and inelastic scattering of 10^2 to 2×10^3 ev, 9: 263(J)

diffusion effects in radioactive sources, 9: 2040(J)

diffusion in argon, 9: 2539(R)

disintegration of the deuteron by, theory, 9: 2533(J)

double scattering of, with magnetic interaction, theory, 9: 1938(J)

drift velocity of, in gases, 9: 6820(R)

effects of exposure to, on barley seed, 9: 3369(J)

elastic scattering by H atoms, perturbation calculation, 9: 1657(J)

elastic scattering by U, differential cross sections, 9: 4613(J)

elastic scattering from protons, angular distributions, 9: 4309(J)

elastic scattering of, by excited 2s and 2p states of atomic H, 9: 1381(J)

elastic scattering of high-energy, by Hg, 9: 3321(J)

elastic scattering of 125-Mev, by Be, 9: 1383(J)

electromagnetic interactions with μ mesons, 9: 2882(J)

emission and multiplication, 9: 3208(R)

emission from freshly worked metal surfaces, 9: 7423(J)

emission from Mg, Al, Fe, Ni, Au, and Pb, by H_1^+ and H_4^+ ion bombardments, 9: 250(J)

Electrons (cont'd)

emission of secondary, by 1.3-Mev electron bombardment, 9: 1306(J)

energy loss cross sections for helium atoms passing through gases, 9: 6700(J)

energy loss distribution in argon-methane mixture, 9: 5698(J)

energy loss distributions of 1-Mev, in Al foils, 9: 5519(J)

energy loss of 15.7-Mev, in traversing gas and solid samples, effect of polarization on, 9: 5806(J)

energy loss of secondary, in a cavity, effects of various wall materials on, 9: 2045(J)

energy loss of 30 kev, in gold and silver foils, 9: 6366(J)

energy loss of 22-kev, in metals, metal oxides, NaCl, $Ca(OH)_2$, and collodion, 9: 1665(J)

energy losses in thin Al, Mg, Cu, and Ag foils, 9: 5790

energy spectra in polar crystals, 9: 4836(J), 4837(J)

energy spectrum of, in ionic semiconductors, 9: 7048(J)

fast, effects of, on growth of tissue cultures, compared with effects of x radiation, 9: 3016(J)

fast, effects of irradiation of alkali halides by, 9: 3329(J)

focusing by TM_{01} waves, 9: 726

gas, spin paramagnetism of as function of temperature, 9: 6363(J)

high-energy, effect of nuclear size on scattering of, 9: 6362(J)

high-voltage from betatron, effects on eyes of rabbits, 9: 6839(J)

of hydrogen and deuterium ions; cross section for photodetachment, 9: 5699(J)

impact on H and Na, transition cross sections for, 9: 5794(J)

incoherent scattering cross sections of high-energy, by nuclei $Z \leq 20$, 9: 5795(J)

inelastic scattering by He, 9: 3994

inelastic scattering of, nuclear multipole transitions in, 9: 785(J)

interaction with electromagnetic fields, quantum effects in, 9: 7216(J)

interactions with matter, 9: 1575(J)

interaction with neutrons, 9: 5754(J)

interaction with neutrons, calculation by meson theory, 9: 7214(J)

interaction with phonons in presence of perpendicular electric and magnetic fields, 9: 7395(J)

interferometer utilizing crystalline diffraction of, 9: 1023(J)

with ions, self-focusing properties of streams, 9: 5695(J)

K, in heavy atoms, coherent scattering of γ rays by, method for evaluating, 9: 2479(J)

lattice and configuration interactions of, and bonds of paired, 9: 6546(J)

mass correction, theory, 9: 1067(R)

multiple scattering, effects on energy loss distributions, 9: 5518(J)

multiple scattering by N and A, 9: 5798(J)

neutrino-electron interaction, possibility of, 9: 6006(J)

nonlinear quantum theory of, 9: 1936(J)

nuclear scattering of, at 0.7 and 1.4 Mev, 9: 4611(J)

orbital periods of, in microtons, 9: 396(J)

outgoing wave functions for, in final states and bremsstrahlung, 9: 7218(J)

penetration of infinite media, theory, 9: 5804(J)

photo-, longitudinal angular intensity distributions of, from various γ irradiators, 9: 4310(J)

photodetachment cross sections of, from H^- and O^-, 9: 7838(J)

photoluminescence of, theory, 9: 414(J)

polarization energy of 3d and 4p, 9: 2816(J)

production of electron showers by, 9: 3561(J)

production of neutrons by, in uranium, 9: 3964

properties of cylindrical space charge in electron optics, 9: 3509(J)

quantum theory of radiating, 9: 1422(J)

Electrons (cont'd)
quantum theory of relativistic, in axial symmetric magnetic field, 9: 5200(J)
radiating, polarization and spin effects in theory of, 9: 5542(J)
ranges in polyethylene, Monte Carlo calculation, 9: 4254
scattered by gold, distribution of, 9: 6699(J)
scattered by nuclear fields, radiative correction to high-energy, 9: 7177(J)
scattering, instrument for recording energy and angular distribution, 9: 7876(J)
scattering angle of, from Bi^{210}, in nuclear emulsions, 9: 715(J)
scattering at high energies, nuclear dispersion contribution to, 9: 4603(J)
scattering by a point charge, Dirac solutions, 9: 1139
scattering by static potentials, calculation of, 9: 7217(J)
scattering by thin gold foils, characteristic energy loss, 9: 7949
scattering of, atomic factors in, 9: 2033(J)
scattering of high-energy, by atomic nuclei, phase shift calculation, 9: 5523(J)
scattering of high-energy, by C^{12}, 9: 7519(J)
scattering of high-energy, by polarized nuclei, 9: 2049(J)
scattering of high-energy, in crystals, 9: 2495(J)
scattering of 192-Mev, by D, 9: 4305(J)
scattering of 0.6-, 1.0-, and 1.7-Mev, from Al and Au, 9: 2485(J)
scattering phase shifts, theory, 9: 1067(R)
scattering of, radiative corrections to, 9: 3317(J)
scattering of 6.6-, 11.5-, and 18.0-Mev, in photographic emulsions, 9: 2942(J)
scattering on tungsten at 31, 40, and 60 Mev, 9: 7562(J)
secondary, from Au, Cu, W, Be, Al, Ag, wood, quartz, and lucite, for primary electrons of 20 kev to 1.3 Mev, 9: 5989(J)
secondary, spatial distribution of energy dissipation by, from high-energy x rays, 9: 422(J)
secondary emission in photomultipliers, 9: 6372(R), 7427(R)
secondary production of, by Cd ions on Cd and Hg ions on Hg, 9: 1562(J)
in solids, interaction with light, and in perfect lattice, quantum theory of, 9: 6553(J)
source scattering of, angular correlation of, 9: 1382(J)
specific ionization of H_2, He, and N_2 by high-energy, 9: 3315(J)
speed distribution in positive column of electric discharge, 9: 6359(J)
sterilization of pharmaceuticals and radiation effects on plastics, 9: 2053(J)
"subexcitation" from ionization processes, roles in radiation effects, 9: 2819(J)
symmetrical theory of, and positrons, 9: 7584(J)
theory, interpretation of Dirac equation for, 9: 7599(J)
three-photon annihilation of electron-positron pairs, 9: 669(J)
trapped in ionic solids, thermal ionization of, 9: 7424(J)
trapping defects in neutron irradiated graphite, density of, 9: 6217(J)
velocity measurement method for high-energy, 9: 1305(J)

Electrophoresis
combined with specific-activity determination in determinations of radiochemical purity, 9: 3262(J)
paper, manual, 9: 3076(J)
paper, recording integrating photoelectric and radioactive scanner, 9: 2393(J)

Electrophotography
evaluation of xeroradiography, 9: 3816

Electrostatic analyzers
procedure for alignment of, 9: 6782(J)

Electrostatic fields
(See also Electric fields; Electromagnetic fields.)
distortion produced in guarded, by grounded external plates, measurement, 9: 314(J)
electron optics in, solution of equations of, 9: 5400(J)

Electrostatic generators
(See also Van de Graaff Accelerators.)
current indicator and integrator for, development, 9: 2099(R)
design and performance of highvoltage, 9: 998(J)
design of, using compressed gas, 9: 5169(J), 5511(J)
design of small belt-type, 9: 5513(J)
nuclear resonance controlled, for proton synchrotrons, 9: 7162
portable Van de Graaff, 9: 1559(J)

Electrostatic lenses
calculation of, from paraxial focusing properties, 9: 1939(J)
for relativistic particles, theory, 9: 2379(J)
spherical aberration in, correction systems for, 9: 3581(J)

Electrostatic precipitation
applied to aerosol filtration, 9: 4831
principles and applications, 9: 4426(J)
theory, applied to deposition of aerosol particles, 9: 934

Electrostatic precipitators
modified, for collection of materials with high resistivity, 9: 4427(J)
performance, 9: 934
performance of, effect of electrical charge of particles, 9: 3557(J)
portable, design, 9: 607(J)

Element ninety-nine
(See Einsteinium.)

Element one hundred
(See Fermium.)

Element one hundred one
(See Mendelevium.)

Elementary particles
(See also specific particles, e.g., Mesons and V particles; see also Bosons; Fermions.)
annihilation of, calculated by electrodynamic models, 9: 6132
charge dependence relations and mass spectrum of, 9: 2002(J)
classification, 9: 7521(J)
complex nature of, theory, 9: 5197(J)
decay into two particles with zero mass, theory, 9: 1420(J)
effects of oscillation of meson shell of nucleons on probability of particle interaction, 9: 458(J)
effects of potential gradient on the density of a degenerate Fermi gas, 9: 4338(J)
emulsion work, V particles, K particles, electron pairs, cosmic showers, review of, 9: 6753(J)
isotopic spin relations in, 9: 5139(J)
mass determination of minimum ionization of, in nuclear emulsions, 9: 5733(J)
mass of, theoretical calculation, 9: 459(J)
mass spectrum, 9: 2007(J)
mathematical formulation of Gell-Mann model for, 9: 7202
multiple production, investigation of, 9: 7543(J)
multiple production, theory, 9: 7486(J)
multiple scattering, mass determination by, 9: 3327(J)
photodisintegration, 9: 4006(J)
scattering in quantum electrodynamics and pseudoscalar theory, 9: 6551(J)
as self-maintained excitations, 9: 7526(J)

Elementary particles (cont'd)

with spin ½, absence of discrete energy levels and cohesive states in, in fixed pseudoscalar potential field, 9: 460(J)

spin ½, effects of radiative corrections on charged, constant magnetic field, 9: 4340(J)

with spin 2, equation for, 9: 3351(J)

spin 0, Hamiltonian for, 9: 7589(J)

new type spin-½, interaction with external field, 9: 2534(J)

strong coupling with meson fields, theory, 9: 1891(J)

symmetry in theory of, review, 9: 5406(J)

theory of, and its application to cross sections for Coulomb scattering, 9: 5541(J)

Elements

abundance of, general discussion, 9: 5050(J)

abundance of, in the earth's crust, 9: 1830(J)

age measurements by radioactive methods, errors in, 9: 6965(J)

atomic scattering factors for 23, 9: 6913(J)

chemical properties, effect of electronic configuration on, 9: 876

dispersion corrections for x-ray scattering by, tables of, atomic number 20 to 96, 9: 6784

equations of state as given by the Thomas-Fermi theory, 9: 6816(J)

formation of, time interval between formation of meteorites and, 9: 6339(J)

heats of sublimation at 289°K, 9: 2137

heavy, nuclear properties of, 9: 7103(J)

isotope shift in x-ray spectra of heavy, 9: 1414

radioactivity induced in, by pile radiation, 9: 6105

solid and liquid, free energy and heats of sublimation, tables, 9: 5079

x-ray critical-absorption and emission energies in kev, table, 9: 3227(J)

x-ray emission spectroscopy with electron excitation, 9: 4905(J)

Elk Ridge Quadrangle (Utah)

photogeologic map of, 9: 3467(J), 5004(J), 5014(J), 5017(J), 5037(J), 5038(J), 6971(J), 6990(J)

Embryos

(See also Fetuses.)

chick, biosynthesis of nucleic acids by, effects of radiation on, 9: 4691

chick, incorporation of carbonates and formates into, effects of x irradiation on, tracer study, 9: 3376

chick, LD_{50} determinations, 9: 822(J)

developing, of Artemia, radiosensitivity, effects of hydration, 9: 3741(J)

developing, of snails, radiosensitivity, 9: 5845(J)

developing, pathological effects of particles on, in rats, 9: 19

developing chick, effects of x irradiation on plasma amino acids levels, 9: 6820(R)

effects of x irradiation, 9: 2547(R)

gamma radiation effects on development of frog, 9: 2581(J)

metabolism in, effects of radiation on, in grasshoppers, 9: 495(J)

pathological effects of x radiation on, of frogs, 9: 820

protein biosynthesis during development of, of frogs, 9: 6899

of rainbow trout, radiosensitivity of various developmental stages, 9: 5844(J)

Emery Quadrangle (Utah)

photogeologic map of, 9: 3833(J), 4446(J), 4447(J)

Emesis

radioinduced, in dogs, 9: 16

Emission spectra

(See also Spectra and specific spectra by name of radiation.)

of bismuth-activated phosphors, CaO(Bi) and SrO(Bi), 9: 6545(J)

of metal surfaces, theory, 9: 2741

Emissivity

measurement, apparatus for, 9: 2793(R)

Emulsions

(See also Nuclear emulsions; Photographic emulsions.)

development of, due to self nucleation, 9: 2800(J)

globule size and interfacial tension in, 9: 6884(J)

preparation, a machine for, 9: 6883(J)

Enanthaldehyde

adsorption on Cu from aqueous solutions as inferred from H_2 overvoltage measurements, 9: 595(J)

Enanthic acid

adsorption on Cu and Ag from aqueous solutions as inferred from H_2 overvoltage measurements, 9: 595(J)

Enanthic acid, sodium salts

synthesis of C^{14}-labeled, 9: 7733

Engineering Research Inst., Univ. of Mich.

(See Michigan. Univ., Ann Arbor. Engineering Research Inst.)

Engineering Test Reactor

description, 9: 5148

Engle Area (N. Mex.)

geophysical exploration, 9: 2709

Entrada Formation (Utah)

geology of, 9: 160

Entrada Sandstone (Colo.)

geology of, in Horse Range Mesa Quadrangle, 9: 7775(J)

Entrainment separators

(See Cascade impactors; Cyclone separators; Electrostatic precipitators.)

Entropy

(See also Thermodynamics.)

of fusion, relation to atomic number, 9: 3552(J)

production and Overhauser nuclear polarization effect, 9: 5773(J)

Enzymes

(See also Cholinesterases.)

action of, on nucleic acids, effects of glucose on, 9: 870(J)

activity of, effects of whole-body x irradiation on, in spleen of rats, 9: 3738(J)

alkaline phosphomonoesterase, identification, 9: 4066(J)

carboxypeptidase inhibitor, effects of whole-body x irradiation on, in mice, rats, and rabbits, 9: 3728

coenzyme A, radiosensitivity of, in rats and guinea pigs, 9: 3729

determination of acetylcholinesterase in tissues, 9: 2099(R)

effects of γ radiation on proteolytic enzyme activity of beef muscle, 9: 2116(J)

effects of irradiation on functional activity of coenzyme A, 9: 2574(J)

effects of radiation on, review in Annual Review of Nuclear Science, 9: 3733(J)

effects of radiation on, review of literature, 9: 2549

effects of radiation on adenosine triphosphatase activity, modification produced by injected spleen homogenates, in mice, 9: 38(J)

effects of radiation on adenosine triphosphatase activity in tissue homogenates, 9: 2587(J)

effects of radiation on 5-nucleotidase and adenosine triphosphatase activity of spleen and thymus gland in rats, 9: 6154(R)

effects of thrombokinase on storage of heparin by mast cells, 9: 1781

effects of total-body irradiation on desoxyribonuclease activity of blood plasma in rats, 9: 2579(J)

effects of total-body irradiation on 5-nucleotidase and adenosine triphosphatase activity of hematopoietic system in rats, 9: 480(R)

effects of total-body irradiation on systems of, in rats, 9: 2548(R)

Enzymes (cont'd)
effects of total-body irradiation on urinary excretion of desoxyribonucleases in rats, 9: 23(J)
effects of total-body x irradiation on desoxyribonuclease II level in spleen of rats, 9: 7242(J)
effects of total-body x irradiation on desoxyribonuclease activity of spleen in rats, 9: 488(J)
effects of total-body x radiation on adenosine triphosphatase and 5-nucleotidase activity of hematopoietic tissues, in rats and mice, 9: 14
effects of treatment with, on radiation-recovery factor in tissue homogenates of spleen and bone marrow, 9: 3370
effects of uranyl chloride on adenosinetriphosphatase of myosin, 9: 4760(J)
heparin-activated, in blood plasma, properties, 9: 2540
indole-3-acetic acid oxidase, ribonuclease, and tryptophan-indoleacetic acid systems, investigation on, 9: 2547(R)
liver concentrations of oxidized and reduced diphosphopyridine nucleotide, effects of total-body x irradiation on, in rats, 9: 3740(J)
localization of tryptophan–indoleacetic acid systems in leaves and effects of radiation on, 9: 3(R)
mechanism of the indole-3-acetic acid oxidase system, effects of strong acids on lysozyme, and the activation of methionine, 9: 4911(R)
physiological activities of, effects of in vitro irradiation on, 9: 4674(J)
purine-metabolizing, of rat liver and spleen, effects of total-body x irradiation on, 9: 2120(J)
pyrophosphatase and adenosine triphosphatase activity of spleen and thymus effects of x irradiation on, in rats, 9: 3(R)
radioinduced inactivation of chymotrypsin, 9: 7238(J)
radioinduced inactivation of, in intact cells, 9: 4349(J)
radiosensitivity of adenosine triphosphatase and 5-nucleotidase activity of spleen and thymus gland, 9: 6580(J)
reaction mechanisms of, in normal and leukemic leukocytes, 9: 6
relationship of, to tumors, 9: 7226(J)

Epinephrine
(See Adrenaline.)

Equation of state
derivation of, for high temperatures and pressures, 9: 7032(J)
of elements by Thomas-Fermi theory, 9: 6816(J)
theoretical calculations based on statistical atomic model, 9: 4642

Equipment and procedures
(See also specific instruments, equipment, processes, materials, etc.)
British, exhibited at Geneva, survey of, 9: 6715(J)
dispenser for radioactive solutions, 9: 5286(J)
insulator clamping device for applications in wide temperature ranges or magnetic fields, 9: 5551(P)

Erbium
neutron-diffraction studies of, 9: 3344(J)
separation from rare earths by ion exchange, 9: 5889(J)
spectrographic analysis of, for Y, Dy, Ho, Tm, and Yb, 9: 5272(J)
spectrographic determination of, in Ho and Dy, 9: 5272(J)
tissue distribution of, in rats, tracer study, 9: 3730(R)

Erbium chlorides
crystal structure, 9: 544(J)

Erbium isotopes Er^{166}
energy levels, 9: 1405(J)

Erbium oxide–uranium oxide systems
phase studies and crystal structure, 9: 7679(J)

Erbium oxides
crystal structure, 9: 7679(J)

Ergosterol
biosynthesis in yeast cells of, effect of ionizing radiations on, 9: 7620(J)

Erie Area (Nev.)
uranium distribution, 9: 1260(J)

Erosion
of high-speed sleeve bearings by steep pressure waves, 9: 5635

Erythrocytes
(See also Hemoglobin.)
destruction of, effects of burns on, in rats, tracer study, 9: 6592
effect of total-body x irradiation on, correlation with tumor development, in rats, 9: 6579(J)
human, Na-K transport in, 9: 5206(R)
labeled with Cr^{51}, elution of Cr, 9: 3049(J)
labeled with Cr^{51} or P^{32}, preparation, 9: 4911(R)
labeled with Cr^{51}, preparation and use in determinations of red-cell volume and measurements of red-cell viability, 9: 6864(J)
nucleated, uptake of Fe by, effects of irradiation on, tracer study, 9: 3011(J)
sodium and potassium exchange in, effects of irradiation, 9: 5222(J)
transport of potassium in, tracer study, 9: 1735(J)
transport of sodium in, tracer study, 9: 1736(J)
uptake of Fe by, effects of whole-body x irradiation on, in ducks, 9: 1155, 2580(R), 5230(J)

Erythropoiesis
effects of intravenously injected plasma from x-irradiated, spleen-shielded rats on, in normal rats, tracer study, 9: 3748(R)
effects of total-body irradiation on, in ducks, tracer study, 9: 5230(J)
effects of whole-body x irradiation on, and stimulation of, in dogs and rats, tracer study, 9: 3739(J)

Escherichia coli
cytological effects of ultraviolet radiation on, 9: 2107, 2108
effects of radiation on, as an indication of radiation dosage, 9: 6572(J)
effects of x radiation on, influence of low temperature on recovery, 9: 2562(J)
growth and cell division of, chemical inhibition, 9: 1461(J)
lethal effects of radiation on, influence of irradiation conditions, 9: 4917(J)
radiation injuries of, effects of cysteamine and β-mercaptoethanol, 9: 4678(J)
radiation sensitivity of, effect of physiological and morphological changes on, 9: 7231
radiosensitivity of, effects of Synkavite on, 9: 5236(J)
recovery from ionizing radiation, nutritional aspects of, 9: 6831(J)
sensitivity of, to thermal neutrons, 9: 2099(R)
x-ray induced mutability in, effect of temperature on, 9: 6832(J)

Estrogens
effects of, on radiosensitivity of mice, 9: 4675(J)

Ethane
direct fluorination, 9: 890

Ethane, bromo-
thermal decomposition of, C^{13} isotope effect in, 9: 7688(J)
thermal decomposition of, from 350 to 450°C, C^{13} isotope effect in, 9: 2143(J)
thermal decomposition of, reaction mechanisms for, 9: 7689(J)

Ethane, 1,1-difluoro-
microwave spectrum from 18,000 to 38,000 Mc, 9: 1771(J)

Ethane, fluoro-
microwave spectrum of, 9: 2184(J)

Ethane, hexafluoro-
infrared spectrometric determination of bond moments in, 9: 2183(J)
infrared spectrophotometry, analysis of small samples by, 9: 7697(J)

Ethane, iodo-
density and thermal expansion, 9: 6868

Ethane, pentafluoro-
infrared and Raman spectra of, 9: 2652(J)

Ethane, trichloro-
atomic electric moments, dielectric constants and polarization of, 9: 3059(J)

Ethanes, chlorofluoro-
atomic electric moments, dielectric constants and polarization of, 9: 3059(J)

Ethanes, halo-
boundary lubrication of steel with, 9: 4979
chlorinated and fluorinated derivatives of, torsional barriers in, 9: 1754(J)

Ethanethiol, 2-amino-
effects of, in radiation sickness, 9: 5234(J)
protective action against x rays and nitrogen mustard, 9: 4358
protective effects of, against radiation damage to hematopoietic tissues in rats, 9: 6580(J)
protective effects of, against radiation injuries in mice, 9: 2121(J)
protective effects of, against radiation injury in E. coli, 9: 4678(J)
in therapy of radiation sickness, 9: 3036(J)

Ethanol
solvolysis of $NfCl_4$ and $ZrCl_4$ in, 9: 4967

Ethanol, 2,2-iminodi-
neutralization titrations of, in anhydrous pyridine, 9: 882(J)

Ethanol, mercapto-
protective effects of, against radiation injury in E. coli, 9: 4678(J)

Ethanol, triphenyl-
mechanism of Wagner-Meerwein rearrangement in, 9: 1755(J)

Ether, bis(chloroethyl)
solvent properties for Hg, 9: 1066(R)

Ether, chloromethyl methyl
atomic electric moments, dielectric constants and polarization of, 9: 3059(J)

Ether, pentafluoroethyl
dielectric constants, 9: 6213(J)

Ethers
removal of hydrogen peroxide from, by cerous hydroxide, 9: 4752(J)
trichloro perfluoro-, infrared spectra and physical properties, 9: 7303(J)

Ethyl ether complexes
with boron trifluoride, reaction with lithium, borohydride and trimethoxyborine, 9: 3055
with boron trifluoride and boron trichloride, electrolytic decomposition, 9: 516

Ethyl ether–uranyl nitrate–water systems
distribution coefficients in, 9: 7312(J), 7313(J)

Ethyl isocyanide
direct fluorination, 9: 890

Ethylamine, 2-mercapto-
(See Ethanethiol, 2-amino-.)

Ethylene
deuterium-labeled, vibrational spectra and constant potential energy, 9: 345(J)
effects of γ radiation, 9: 583(J)
energy required to produce one ion pair, 9: 5702(J)
ion pair formation, 9: 4039(R)
molecular theory, 9: 4479(R)
radioinduced polymerization of, 9: 1550(R)
vibrational spectra and constant potential energy, 9: 345(J)

Ethylene–argon systems
viscosity of, at 25°C, 9: 3213

Ethylene, chloro- polymers
electric resistance, 9: 3889(R)

Ethylene, chlorotrifluoro-
dielectric constants, 9: 6213(J)
energy loss of 15.7-Mev electrons in, effect of polarization on, 9: 5806(J)
Raman spectra, 9: 1137(J)

Ethylene, chlorotrifluoro- polymers
boundary lubrication of steel with, 9: 4979
compression of, at high pressures, temperature dependence, 9: 863(J)

Ethylene, fluoro-
polymers, compression of, at high pressures, temperature dependence, 9: 863(J)
vibrational spectra of $CF_2 = CHD$ and $CF_2 = CD_2$, 9: 1770(J)

Ethylene glycol
yield from decomposition of methanol by Co^{60} gamma radiation and 28-Mev He ions, 9: 2202(J)
yield from decomposition of methanol–water solutions by Co^{60} gamma radiation, 9: 2203(J)

Ethylene glycol systems
electric conductivity and anodic corrosive effects on Ta, 9: 230

Ethylene polymers
compression of, at high pressures, temperature dependence, 9: 863(J)
effect of γ radiation on the solid state, 9: 5176(J)
effects of β particles on, 9: 2664(J)
physical, chemical, and mechanical properties of irradiated, 9: 6642(J)
preparation, physical properties, and effects of radiation, 9: 4971
ranges of electrons in, Monte Carlo calculation, 9: 4254
welding techniques and nondestructive testing, 9: 3760(R)

Ethylene, tetrachloro-
energy loss of 15.7-Mev electrons in, effect of polarization on, 9: 5806(J)
radiosensitivity of mixtures of chloroform and, 9: 4241(R)

Ethylene, tetrafluoro- polymers
compression of, at high pressures, temperature dependence, 9: 863(J)
effects of β particles on, 9: 2664(J)
impregnation of stainless steel bearings with, for use in water, 9: 6267(J)
paramagnetic resonance of x-irradiated, 9: 5179(J)
paramagnetic resonance of x-irradiated, effect of O_2 adsorption on, 9: 7965(J)
properties and synthesis, 9: 6210(R)
three-quantum annihilation of positrons in, 9: 249(J)

Ethylenediaminetetraacetic acid
(See Acetic acid, (ethylendiamine)tetra.)

Ethylenimine
direct fluorination, 9: 890

Euglena
carbon dioxide fixation in, 9: 7272(R)
carbon dioxide metabolism, tracer study, 9: 2136(R)

Eureka Area (Alaska)
uranium distribution in, 9: 1523(J)

European Organization for Nuclear Research, Geneva
research program and organization, 9: 4660

Europium
chelation with thenoyltrifluoroacetone, 9: 924(J)
oxidation states in alkaline earth oxide and sulfide phosphors, 9: 6618(J)
radiochemical determination, 9: 876

Europium (cont'd)
separation from Sm by electrolysis, 9: 4407(J)
slow-neutron resonances, radiation width variations in, 9: 5477(J)
tissue distribution of, in rats, tracer study, 9: 2551(R)
x-ray absorption spectra (L), 9: 4904(J)
x ray emission spectrum, 9: 6129(J)
Europium chlorides
reactions of $EuCl_2$ with HCl saturated with H_2, O_2 or air, 9: 5296(J)
Europium ions
separation by ion exchange, 9: 910(J)
spectra, theory of, 9: 2978(J)
Europium(III) ions
orientation in CaF_2 crystals, 9: 1934(J)
Europium isotopes
energy levels, spacings and neutron widths of, 9: 6045(J)
tracer techniques in agitators of U pilot leach plant, 9: 2261
Europium isotopes Eu^{151}
neutron resonance widths, 9: 4039(R)
nuclear spin and Eu^{151}/Eu^{153} magnetic moment ratio, 9: 2904(J)
Europium isotopes Eu^{152}
bone deposition of, in rats, 9: 7232(R)
decay schemes, 9: 439(J)
Europium isotopes Eu^{153}
decay schemes, 9: 988(R)
energy levels, 9: 1683(J)
nuclear spin and Eu^{151}/Eu^{153} magnetic moment ratio, 9: 2904(J)
Europium isotopes Eu^{154}
bone deposition of, in rats, 9: 7232(R)
decay schemes, 9: 439(J)
decay schemes and nuclear spectra, 9: 4863
Europium isotopes Eu^{155}
fission yield of, from natural U, 9: 1700(J)
Evaporation
of water, pressures and rates of, 9: 937
Evaporators
(See also Distillation apparatus.)
design and operation of remotely controlled surface, for routine analytical work, 9: 100(J)
design and operation of vacuum, using a vacuum valve and ion gage protective circuits, 9: 5705
high-pressure wetted-wall, performance, 9: 937
Evolution
of biological systems, by chemical synthesis, 9: 7224
Experimental breeder reactors
design, 9: 757(J), 3294(J)
Exploration
(See also appropriate subheadings under specific materials sought; see also Geophysical exploration; Prospecting.)
book on methods for, of U, Th, and Be, 9: 960(J)
Explosions
(See also Atomic explosions; Detonation waves; Shock waves; Thermonuclear explosions.)
detonation velocity, measurement by microwave resonator techniques, 9: 4264
impact shock waves from, mechanical response of different parts of a living rabbit body, 9: 6564(J)
involving commercially pure Ti and red-fuming nitric acid, 9: 3456(J)
reaction zone of, mathematical analysis, 9: 1905
relation between velocity and radius of curvature of detonation wave in, 9: 995(J)
Explosions (cont'd)
rotating-mirror framing camera for photographing, 9: 2384
Explosives
(See also Atomic weapons.)
condensed, diameter effect in relation between velocity and radius of curvature of detonation wave, 9: 995(J)
crystal size of, influence on explosions, 9: 2498(J)
effects of radiation on, 9: 2498(J)
explosive properties of polyvinyl nitrates, 9: 1747(J)
mass loading, relationship to detonation, 9: 7026
properties, composition, behavior, uses, and effects, text book on, 9: 6598
reaction zone length and pressure in RDX mixture, 9: 5977(J)
Exponential piles
neutron flux variation with number of fuel elements present, 9: 2445
thermal neutron distribution from fast sources in, theory, 9: 368
Exposure chambers
(See Radiation exposure chambers.)
Extensometers
(See also Strain gages.)
design of, 9: 1820(R)
Extraction apparatus
(See also Ion exchangers; Packed columns; Pulse columns; Scrubbers; Spray columns.)
centrifugal extractor, operating characteristics, 9: 1212
design, flow capacity, and mass transfer, review, 9: 3105(J)
design and capacity factors in performance of perforated-plate, 9: 1480
design and performance of horizontal liquid-liquid, 9: 2208
design and performance of semiautomatic, for gas separation, 9: 2211(J)
design of sieve plate pulse columns, effect of geometry variables on, 9: 6240
effect of pulsation on packed and sieve-plate columns, 9: 5300(J)
efficiency of extraction columns, 9: 6231(J)
exaggerated grain growth in, 9: 1545(J)
power requirements for pulse generation in pulse columns, 9: 5301(J)
pulse column development, 9: 5933
Extrusion
design and performance of equipment for Ti alloy, 9: 2276(R)
design of equipment for low-density foamed Al–Mg alloys, 9: 3182
of light and ferrous metals, ingot container for, 9: 6294(J)
power requirements in, theoretical determination, 9: 4193(J)
theory, 9: 4190(J)
Eyes
chorioretinal burns of, produced by atomic flash, 9: 3026(J)
effects of exposure to γ radiation on, in monkeys, 9: 6162(J)
effects of high-voltage radiation on, of rabbits, 9: 6839(J)
effects of radiation, 9: 3722, 3723, 3724, 3725
effects of radiations from an atomic explosion on, 9: 7624(J)
effects of radiation on, in albinotic and pigmented guinea pigs, rabbits, rhesus monkeys, and dogs, 9: 4669(J)
erupt, radioinduced, in Drosophila, 9: 3022(J)
fetal, effects of radiation on, in mice, 9: 6838(J)
induction of cataracts by exposure to β particles, 9: 2118(J)
late effects of exposure to β particles on, in man, 9: 4347(J)
mechanism of response of, to light and x radiation, in frogs, 9: 5214(J)
neoplasms of, differential uptake of P^{32} in diagnosis, 9: 49(J)
radioinduced and aging changes in lens epithelium of, in rabbits, 9: 7623(J)
radioinduced cataracts of, mechanisms of production in rabbits, 9: 494(J)
of rat fetuses, radiosensitivity, 9: 5575(J)

F

Fairhaven Creek Area (Alaska)
uranium distribution in, 9: 1523(J)

Fall Creek Prospect (Idaho)
uranium distribution in, stratigraphy, 9: 2263

Fall-out
(See also Fission products.)
dispersal, meteorological factors affecting, 9: 7492
dosage determinations, size measurement, and deposition, 9: 6845
effects of and protection from, basic discussion of, 9: 6148(J)
gamma radiation from, effects of environmental factors on reduction, 9: 2590
in Kingston, Ontario, monitoring, 9: 7093(J)
mechanism of, 9: 4659
monitoring, following Operations Hurricane and Totem, 9: 35(J)
monitoring of, in the United States and Canada following Operation Teapot, 9: 7636
production, distribution, and biological hazards, 9: 6818(J)
from thermonuclear explosions, pathological effects, 9: 5861(J), 5866(J), 5867(J), 5868(J)

Far West Willys Group (Nev.)
exploration, geology, and mineralogy, 9: 1516(J)

Faraday effect
(See Magneto-optical rotation.)

Fast neutrons
angular distribution of, scattered from lead, 9: 5522(J)
biological effects of, compared with effects of γ radiation on cataract formation in mice, 9: 3(R)
biological effects of, compared with effects of x radiation, in mice, 9: 6567
biological effects of total-body exposure to, compared with effects of x irradiation, in dogs, 9: 5213
cataracts induced by exposure to, 9: 7245(J)
chromosome changes and point mutations induced by exposure to, in Drosophila, 9: 4916(J)
in circulating fuel reactors, diffusion, 9: 5493
depth dose curves in tissue, 9: 4483
detection and measurement with Hornyak button, 9: 7957
detection by Be-shell G-M tube, 9: 7857(J)
detection and measurement, comparison of tissue-equivalent ion chambers and recoil proportional counters for, 9: 3951(J)
detection and measurement of, calibration of BF_3 proportional detectors for, 9: 5422
detection and measurement of, instrument for, 9: 6820(R)
detection and measurement of, monitor design, 9: 3934
detection and measurement of, use of reaction $T(d,n)He^4$ for comparison of methods for, 9: 3985(J)
detection using the S^{32} (n,p) P^{32} reaction, 9: 3927
dosimeter for, operating characteristics, 9: 3252
dosimetry, 9: 2539(R)
dosimetry, performance of chemical radiation detectors for, 9: 700
effects on barley seed, 9: 3369(J)
effects on chromosome aberrations in Datura, compared with effects of thermal neutrons and x radiation, 9: 5233(J)
effects on electrical properties of n-type Ge, 9: 5812(J)
evaluation and modification of Raychronex E-1 dosimeter for, 9: 5425
genetic effects of, compared with effects of x radiation in Drosophila, 9: 824(J)
lethal dosage determinations for mice, 9: 2547(R)
moderation in SiO_2 and $CaCO_3$, 9: 3999(J)

Fast neutrons (cont'd)
monitoring of, with In-foil detectors, 9: 6401
polarization, review, 9: 1400(J)
reflection from moderators, 9: 4883
scattering by nonspherical nuclei, theory, 9: 6814(J)

Fatigue
corrosive, of metals, adsorptive beginning of, 9: 4811(J)
criterion for minimum scatter in, 9: 1816
endurance limit, determination of, 9: 7391
equipment for testing, 9: 2238
hydraulic pulsing test equipment for measuring fatigue life of materials in hydraulic systems, 9: 6641
metal, apparatus for testing, 9: 4987
of metals, theory, 9: 4814(J)
methods of measurement, 9: 3855(R)
shape as a factor in, 9: 5060
statistical estimation of the endurance limit, 9: 5056
statistical theory of size and shape effects in, 9: 1815
testing equipment for Al alloys, 9: 7358
theory of fatigue failure under combined stress, 9: 4159
theory of fracture and, 9: 7018(J)

Fatty acids
effect of ionizing radiation on essential, in aqueous media, 9: 106
metabolism of, in liver, effects of pantothenic acid on, in rats, tracer study, 9: 5304
metabolism of, in rats, 9: 4415
metabolism of, incorporation of linoleate into arachidonic acid in rats, tracer study, 9: 6629
metabolism of, tracer study, 9: 7669(J)
of rat livers, effect of irradiation on incorporation of C^{14}, 9: 5853(J)

Feedback systems
book, "Feedback Control Systems," 9: 3228(J)
frequency-response method applied to automatic control, bibliography, 9: 287(J)

Fermions
(See also Electrons; Elementary particles; Mesons; Neutrinos; Neutrons; Protons.)
colliding, relativistic wave functions of, 9: 816(J)
effects of potential gradient on the density of a degenerate Fermi gas, 9: 4338(J)
interactions with bosons, universality of, 9: 5821(J)
renormalization of a neutral vector meson interaction with, 9: 1694(J)

Fermium
(See also Transplutonic elements; Transuranic elements.)
discovery and nuclear properties, 9: 7143(J)

Fermium isotopes
disintegration, 9: 4976

Fermium isotopes Fm^{254}
disintegration, 9: 4705(R)
gamma spectra, 9: 4319(J)

Fermium isotopes Fm^{255}
spontaneous fission decay, 9: 5307(J)

Ferritic stainless steel
(See Stainless steel (ferritic).)

Ferroin
effects of γ radiation, 9: 3267(J)

Fertilizers
production of, from Florida leached zone material, 9: 1183(R), 1746(R), 5640(R), 5641, 6877

Fetuses
(See also Embryos.)
developing eyes in rat, effects of maternal x irradiation on, 9: 5575(J)
eyes of mice, effects of irradiation on, 9: 6838(J)
fluoride transfer to, following prenatal ingestion of, 9: 7228(J)
human, thyroidal uptake of iodine in, tracer study, 9: 4694(J)
skeletal development in, effects of irradiation on, 9: 6828(J)
Fibrinogen
native and urea-denatured, hydrodynamic properties, 9: 859(J)
Field theory
(See also Nuclear theory; Quantum electrodynamics.)
absence of discrete energy levels and cohesive states of particles with spin ½ in fixed pseudoscalar potential fields, 9: 460(J)
adiabatic form of perturbation theory in particle interaction with quantum field, 9: 4906(J)
coupled meson and nucleon fields, lattice space quantization, 9: 2992
for electromagnetic-meson field, six-dimensional, 9: 6138(J)
equations of self-consistent fields for nuclei by calculation of electrostatic force, 9: 456(J)
interaction of two quantized fields, 9: 4030(J)
interactions of free nucleons, 9: 2091(J)
meson, of strong coupling of nucleons, 9: 1421(J)
meson pair, treatment with Møller scattering matrix and S matrix, 9: 5544(J)
nonlocal, dynamically deformable form factor, 9: 5197(J)
quantized, relation of functional analysis to Hamiltonian approach to strong coupling, 9: 3703(J)
quantum, 9: 7598(J)
quantum, causal operators in, 9: 2093(J), 2094(J)
quantum, condition of causality in, 9: 7595(J)
quantum, electromagnetic field in Lagrangian, 9: 7979(J)
quantum, general assumptions and mathematical considerations, 9: 5543(J)
quantum, introduction of dynamic variables in, 9: 4029(J)
quantum, mass and charge renormalization in covariant equations of, 9: 2092(J)
quantum, review, 9: 4907(J)
quantum, with nonlocal interaction, unitarity of S matrices in, 9: 2994(J)
quantum, with nonlocal interactions, construction of scattering matrices, 9: 6813(J)
renormalization of a covariant approximation scheme in, 9: 2998(J)
strong-coupling, for case of pseudoscalar coupling, quantization of, 9: 3705(J)
tensor forces dependent on velocity, 9: 815(J)
variable mass equations of, 9: 3349(J)
Films
(See also specific films as identified by material.)
bibliography on metal and dielectric, and filters, 9: 4930
effect of angle of inclination and mass flow rate on heat-transfer coefficient of falling liquid, design data, 9: 3133(J)
formation on metals and alloys, mathematical analysis, 9: 3884(J)
gage for thickness measurements, 9: 4502(J)
halide ion-sensitive, for water aerosols, 9: 1001(J)
preparation of thin, of Pu and U, 9: 3945(J)
preparation of thin, without plastic supports, 9: 7825(J)
Filter materials
(See also specific filter materials, e.g., Asbestos; Glass wool; see also Metallic filters.)
efficiency of, in removal of monodisperse solid aerosols, 9: 531
Filter papers
electroösmosis in, employing electrochromatography with electrode vessels, 9: 1220(J)
Filter papers (cont'd)
electroösmosis of lactic acid solutions in, employing electrochromatography with electrodes on paper, 9: 1221(J)
lignin, effectiveness of, for removal of dust and microörganisms from air of inhabited rooms, 9: 3361(J)
Filters
(See also Gas mask canisters; Glass filters; Glass wool filters; Membrane filters; Traps; Water purification equipment.)
air, table of disposable, 9: 3090(J)
air sterilization by glass wool filters, performance, 9: 4425(J)
bibliography on preparation and properties, 9: 4930
fiber and wall-membrane, performance in removing magnetite, 9: 6946(R)
glass fiber, for filtering radioactive aerosols, 9: 1491
performance of, for radioactive-dust collector, 9: 1801(R)
removal of radioactive contaminated matter by, 9: 6716(J)
Filtration
of aerosols in laminar flow by curved tubes, 9: 4488
effects of porosity on constant rate, equations, 9: 5302(J)
Finland
gadolinium minerals distribution in, 9: 7335
Finned tubes
heat transfer by free convection from, 9: 1808
Fires
(See also Sodium fires.)
prevention, nuclear detector for, 9: 2832(J)
Firth Sterling, Inc., Pittsburgh
progress reports on titanium carbides, 9: 4991(R)
Fish
embryos of, effects of x irradiation on, 9: 5844(J)
radiothyroidectomy of salmon parr, following ingestion of I^{131}, 9: 828(J)
Fission
(See also Multiplication factor; Nuclear reactions; Proton fission; Spallation; Spontaneous Fission.)
asymmetric, model for, 9: 5478(J)
asymmetry of, and spatial conception of nuclear levels, 9: 745(J)
asymmetry of, interpretation by liquid drop model, 9: 4550(J)
fine structure in yield of, in mass region 99 to 106, 9: 670(J)
mass and charge distribution in thermal, review, 9: 3791(J)
number of neutrons emitted, measurements for U and Pu isotopes, 9: 7932(J)
theory of high-energy induced, 9: 5116
thermal neutrons from Pu^{241}, 9: 7095
thermodynamic theory of, applied to Pu^{239}, 9: 5507(J)
of uranium (U^{235}), energy spectrum of γ rays from, 9: 7957
uranium (U^{233}) fragments, average kinetic energy of, 9: 5832(J)
Fission chambers
(See also Ionization chambers.)
design and operation, 9: 3257(J)
design of fast, for fission counting, 9: 1971(J)
electrical characteristics, 9: 3258(J)
preparation of thin Pu and U films for, 9: 3945(J)
Fission products
(See also Fall-out; Radioisotopes.)
absorption in plants, 9: 5837
adsorption of, on montmorillonite clay, 9: 1234
adsorption on montmorillonite as waste disposal process, 9: 929(J)
chemical and industrial applications, 9: 579(J)
detection and measurement, by Kanne chamber, 9: 1038
determination of, in irradiated U, performance of γ spectrometer for, 9: 3264(J)

Fission products (cont'd)

gamma decay after reactor shutdown, 9: 3977

gamma radiation from, 9: 2983

handling of spent MTR fuel rods for radiation sources, cost factors, 9: 3122

industrial use of spent MTR fuel rods as γ sources for radiosterilization of foods, and drugs, cost factors in, 9: 3122

industrial uses, bibliography, 9: 7028

ionization by, and industrial uses, 9: 3208(R)

ionization by α particles and fission fragments, 9: 2821

mass spectrographic analysis utilizing crossed electric and magnetic fields, 9: 4246

from Operations Hurricane and Totem, uptake by plants and animals, 9: 35(J)

particle size measurement of aerosols of, 9: 819

production of electric power from, survey of methods for, 9: 3716(J)

from proton fission of Bi, Th, and U, distribution curve, 9: 7936(J)

as radiation sources for use in radiation chemistry and food treatment, 9: 1550(R)

radiochemistry and utilization, 9: 6561(J)

radiometric analysis of, standardization, 9: 4244

rare-earth, rapid separation of, by ion exchange with lactic acid as eluant, 9: 3427(J)

recovery from waste solutions, 9: 2099(R)

removal of gaseous from reactor fuels by stripping, 9: 7921

response of NaI(Tl), KI(Tl), and stilbene to, 9: 1606

separation and radiometric analysis, 9: 876

separation and radiometric determination of, from contaminated soil, 9: 534

separation from U by the fluoride volatility process, pilot plant, 9: 6227

separation of, from process wastes, pilot plants, 9: 4504(R)

separation plants and procedures, 9: 590(J)

in spent MTR fuel assemblies, γ energy spectrum for, 9: 5531

from 280-Mev deuteron bombardment of tungsten, yields, 9: 7937(J)

uptake of, by plants from contaminated soil, pathological effects of, 9: 9

uptake of, in soil, 9: 7283(J)

of uranium U^{228}, yields of Ce and Nd isotopes in, 9: 7982

from uranium (U^{234}), distribution, 9: 5776

utilization in food sterilization, 9: 1702(J)

Fission recoils

chemical effects in, 9: 3422(J)

Flash burns

(See Burns.)

Flat Top Mesa Area (Utah)

mineralogy, 9: 1829

Flavonoids

chemical properties and physiological effects, 9: 3388(J)

chromatographic separation of, from tobacco leaves, 9: 3(R)

effects of therapy with, on radiation injuries in cancer patients, 9: 839(J)

Flocculation

fundamental studies of, application of infrared spectroscopy to, 9: 50

Florida

map of geophysical exploration of Fort Myers Area in Charlotte and Lee counties, 9: 1526

map of geophysical exploration of the Gardner Area in De Soto, Hardee, Manatee, and Sarasota counties, 9: 1832(J)

Florida (Nassau Co.)

map of geophysical exploration of Folkston Area in, 9: 1831(J)

Florida leached zone material

acid leaching, 9: 7673

acid leaching of, for recovery of Al, U, and P, 9: 7271

Florida leached zone material (cont'd)

acid leaching of, for recovery of U_3O_8, P_2O_5, and Al_2O_3, 9: 5921

aluminum and uranium recovery, effect of calcination, acid strength, and digestion time on, 9: 7271

aluminum recovery from, by crystallization of ammonium aluminum, 9: 5880

analysis for small and large amounts of F in, 9: 5265(J)

beneficiation and processing, 9: 5640(R)

colorimetric determination of Al in, 9: 880

fertilizer production from, 9: 1183(R)

nitric acid leaching of, for recovery of U_3O_8, P_2, O_5, and Al_2O_3, 9: 618

phosphate recovery and processing, 9: 6877

phosphate recovery from, 9: 6184

processing, Al recovery flow diagrams, and cost factors, 9: 7257

processing for production of NH_3, HNO_3, and NH_4NO_3, cost factors, 9: 7270

processing for recovery of P_2O_5 and U, 9: 5641

processing of, for nitric phosphate fertilizer, 9: 1746(R)

processing of, for recovery of Al, 9: 5881

processing plant cost estimates, 9: 6879

processing plants, 9: 6878

Florida, Univ., Gainesville

progress reports on preparation of fluorine-containing compounds, 9: 4951(R)

Flotation

(See also appropriate subheadings under materials being separated.)

bubble–mineral attachment in, theoretical analysis of, 9: 148(J)

bubble pick-up studies with alumina, 9: 4722(J)

fundamental studies of, application of infrared spectroscopy to, 9: 50

review, 9: 3161(J)

techniques and theory in industrial mineral engineering, 9: 4982(J)

Flotation reagents

(See also Surface-active agents.)

review, 9: 3161(J)

Flowmeters

(See also Fluid flow; Gas flow; Liquid flow.)

bibliography, 9: 4761

design and performance of electromagnetic, 9: 3810

design of multi-range, 9: 2196(J)

development of, for air mass-flow rate, 9: 7431

electromagnetic, calibration, 9: 4179(R)

micro-, for gas flow measurements, design and calibration, 9: 2655

operation and performance, literature survey on, 9: 2699(J)

Fluid flow

(See also Compressible flow; Convection; Gas flow; Incompressible flow; Liquid flow; Plastic flow; Subsonic flow; Supersonic flow; Transonic flow.)

boundary layer, with variable Prandtl number, 9: 6638

break-away cavitation behind cylinder, mathematical analysis, 9: 3177

in closed system of steam-generating pipes, deposition of salts and temperature distribution, 9: 3449(J)

in curved pipes, 9: 6954(J)

density gradient in, effect on Taylor instability, 9: 3446

dynamics of, review, 9: 3136(J)

equation for Knudsen flow through a circular capillary, 9: 5939(J)

evaluation of two-phase pressure drops in steam-water mixtures, literature survey, 9: 6243

gas-liquid, in vertical tubes, 9: 2234(J)

gas-liquid, stability limits in vertical tubes, 9: 7322(J)

Fluid flow (cont'd)
of gas-liquid mixtures in horizontal pipes, 9: 4133(J)
heat transfer and pressure drop of, in starting area of air-passed slots, 9: 2230(J)
heat transfer in compact heat exchangers, 9: 4983
heat transfer in a long cylindrical cell, 9: 4128
interface instability of the Helmholtz type, 9: 138
laminar-turbulent, transition phenomena in pipes and annular cross sections, 9: 3131(J)
of liquid metals in annuli, heat transfer coefficients between, 9: 6251(J)
mathematical analysis of Taylor instability and laminar mixing, 9: 6245
mechanism of, 9: 1237
natural convection heat transfer from flat plates in, 9: 4770
pressure and erosion in cavitation region, 9: 1241(J)
properties in air-fluidized particle beds, 9: 6250(J)
pulsating, literature survey on measurement of, 9: 2699(J)
review, 9: 3134(J)
shapes of cavitation region on a transverse foil in a normally incident stream, 9: 3128(J)
solutions of equations for hydrodynamic shocks, 9: 6952
structure of the cavitation region, 9: 1240(J)
turbulent and laminar, heat transfer from flat plates, 9: 6951
velocity distributions in tubes and parallel plates, 9: 5315(J)

Fluid flow (laminar)
analyses for free convection in fluids having a volume heat source, 9: 1492
boundary layer with heat transfer and pressure gradient, theoretical analysis, 9: 4768
effects of, on absolute rates of dissolution, 9: 3448(J)
free and forced convection heat transfer, 9: 2229
motion in boundary layer near line of intersection of two planes in viscous incompressible, 9: 4134(J)
through granular media, 9: 5937
velocity distribution of, in circular tubes, dye technique for measurement of, 9: 6248
velocity measurements, tracer technique, 9: 4988

Fluid flow (turbulent)
boundary layer calculation in presence of heat transfer, 9: 5317(J)
calculation of resistance in, 9: 1812(J)
in conical diffusers, velocity and pressure distributions, 9: 4774(J)
deflection of non-uniform streams, mathematical analysis, 9: 1803
effects of, on absolute rates of dissolution, 9: 3448(J)
heat transfer, with variable Prandtl number, 9: 6638
heat transfer and analysis of, in annulus with various eccentricities, 9: 4433
with heat transfer at smooth walls, mathematical analysis, 9: 3126
heat transfer film coefficient of water suspensions in, containing solids of high thermal conductivity, 9: 2236(J)
mass and heat transfer with, analogy between, 9: 4132
measurement, hot-wire anemometer for, 9: 4764
motion in boundary layer near line of intersection of two planes in viscous incompressible, 9: 4134(J)
in an open thermosyphon, theory, 9: 6252(J)
in pipes, general heat transfer law, 9: 3447(J)
velocity and pressure distribution in pipes, 9: 3445
velocity distribution, behind a cylindrical system, 9: 4775(J)
vorticity and deformation in, kinematical properties of, 9: 1494(J)

Fluid fuel reactors
(See also Homogeneous reactors; Liquid Metal Fuel Reactor.)
development, 9: 6768(J)
kinetics of low-power, theory, 9: 5493

Fluid reactor fuels
(See Reactor fuel alloys (liquid); Reactor slurries; Reactor solutions.)

Fluids
(See also Body fluids; Hydraulic fluids.)
interface instability of the Helmholtz type, 9: 138
mixtures, control of composition in flowing streams of, 9: 5552(P)
molecular transport properties of, review, 9: 3135(J)
theories of, to predict scattering of x rays, 9: 6097(J)

Fluoberyliates
hydroxy-, of alkali metals and NH_4, preparation and properties, 9: 5899(J)
hydroxy-, of Ca, Ba, Sr, Pb, Ce, La, and Hg, preparation and properties, 9: 5900(J)

Fluoborates
decomposition of mixed diazonium fluoroborates, 9: 4743(J)
(See also Ammonium fluoborates; Potassium fluoborates; Rubidium fluoborates.)
dissociation of, in anydrous hydrofluoric acid, 9: 866(J)

Fluochromates
spectra and electronic structure, 9: 4957(J)

Fluoranthenes
perfluorination of, 9: 2650

Fluorescence
(See also Luminescence; Phosphorescence.)
energy conversion during, 9: 3275
induced by α, β and infrared irradiation, 9: 7494(R)
of liquid phosphors, increasing efficiency of, 9: 3952(J)
nuclear resonance, interpretation of, in presence of branching or internal conversion, 9: 7504(J)
radiation-induced, in organic solutions, 9: 4316(J)
of radioelements, discussion of spectra of, 9: 6473(J)
of vapors of organic compounds, energy transfer in, 9: 6191(J)
yield, variation with Z, 9: 6472(J)
yields of bismuth L levels, 9: 6514(J)

Fluoroethers
chemistry, 9: 7303(J)

Fluoride complexes
(See also specific fluoride complexes, e.g., Lithium fluoride complexes.)
formation in fluosulfonic acid, 9: 3416(J)
with Sc^{3+}, Cu^{2+}, Pb^{2+}, Zn^{2+}, Hg^{2+}, Hg_2^{2+}, Sn^{2+}, and Ag^{+}, formation and thermodynamic constants, 9: 4742
studies on Cu, Zn, Ag, and Hg, 9: 2136(R)
with U^{4+}, stability at various temperatures, 9: 5629(J)

Fluoride volatility processes
pilot plant, operation and flow sheets for, 9: 6227

Fluorides
(See also specific fluorides.)
acidimetric determination, 9: 4732(J)
atmospheric, determination following ion-exchange separation, 9: 1776(J)
colorimetric determination, 9: 5894(J)
colorimetric determination of, in urine, 9: 4076
effects of on cathodic potential of Tl in HF, 9: 7711(J)
lung deposition and biological effects of, when combined with rare earths, in guinea pigs, 9: 7256(J)
microchemical detection of, in organic and inorganic substances by Na fluosilicate crystal test, 9: 3412(J)
microwave absorption cell for, design and construction, 9: 1062(J)

Fluorides (cont'd)
polarographic reduction of ferric ion in presence of, 9: 4736(J)
prenatal ingestion of, and transfer to fetus, 9: 7228(J)
pyrohydrolytic determination of, design of apparatus for, 9: 3411(J)
urinary excretion of, effects of renal tubular injury, 9: 1730(J)
Fluorination
design and performance of a jet reactor for, 9: 890
Fluorine
absorption by NaF, 9: 3082
chemical and physical properties, molecular dissociation, viscosity, thermal conductivity, and rate of dissociation, 9: 894(J)
chemistry, 9: 5282
combustion determination in highly fluorinated organic compounds, 9: 2186(J)
conversion to HF with superheated steam at 500°F, 9: 5550(P)
corrosive effects on metals by alternate exposure to liquid and gaseous fluorine, 9: 4142
determination of small and large amounts in rocks, 9: 5265(J)
effects of dietary, on bone deposition of S in swine, 9: 1156(R)
elastic scattering of protons by, 9: 796(J)
in electrolytic deposition of zinc, effect of, 9: 891(J)
energies of K transitions of π-mesonic x rays from, 9: 1909(J)
intermolecular forces and virial coefficients, 9: 3081
isotopic exchange of, between F_2 and HF, 9: 7710(J)
metabolism of, by thyroid gland, 9: 2610(J)
metabolism of, in domestic animals, tracer study, 9: 1156(R)
neutron reactions (n,nγ) at 4.5 Mev, γ rays from, 9: 4589(J)
nuclear magnetic resonance in KF solutions, 9: 5084(J)
production cell, design and operation, 9: 4398(J)
production cell, efficiency, 9: 4396
production of, design and operation of a plant for, 9: 4397(J)
proton reactions, 9: 1349(J)
reaction kinetics of, in fluorination of UF_4 for preparation of UF_6, 9: 3385
semimicro determination in organic compounds, 9: 2166(J)
spin-rotation coefficient of, in Li^9F, 9: 7900(J)
vasodepressor action of, in dogs, 9: 3046(J)
volumetric determination of, in plants by distillation from H_2SO_4 solution, 9: 5270(J)
Fluorine compounds
molar refractions and refractive indices, 9: 546
organometallic and organometalloid, preparation of, 9: 893(J)
Fluorine ions
distribution of charge after passage through matter, 9: 5175(J)
Fluorine isotopes F^{18}
metabolism of, in domestic animals, 9: 7668(J)
production of, by 0.4- to 3.0-Bev proton bombardment of Al, cross sections for, 9: 6074(J)
from radiative capture of 1.2- to 2.2- Mev α particles in N^{14}, 9: 6490(J)
Fluorine isotopes F^{19}
activation determination with α source, 9: 1650(J)
alpha reactions, 9: 1362(J)
Coulomb excitation by α particles, 9: 1362(J)
Coulomb excitation functions for and energy levels for, bombarded with 3.5-Mev α particles, 9: 423(J)
deuteron reactions (d,γ), energy and intensity of γ rays from, 9: 379(J)
elastic scattering of 400 to 1600 Kev protons by, differential cross sections for, 9: 6100(J)
energy levels, 9: 1349(J), 3679(J)
energy levels from Ne^{19} and O^{19} decays, 9: 363(J)
gamma emitting levels in, between excitation energies 8.5 and 9.8 Mev., 9: 6444(R)
Fluorine isotopes F^{19} (cont'd)
gamma reactions (d,γ), spectra, 9: 7121(J)
gamma reactions (γ,2p), N^{17} yield curve from, 9: 3644
gamma spectrum from bombardment by protons, 9: 5505(J)
inelastic neutron scattering in, up to 2.2 Mev, 9: 7516(J)
inelastic scattering of protons by, γ radiation from, 9: 3679(J)
magnetic moment of 167-kev excited state, 9: 7910(J)
nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)
nuclear magnetic resonance in, 9: 7025(R)
proton capture resonance between 0.5 and 2.2 Mev, 9: 7129(J)
proton elastic scattering cross sections, 9: 6101(J)
proton reactions (p,γ) and (p,$\alpha\gamma$), study of γ rays from, 9: 2918(J)
proton reaction (p,n), threshold value in, 9: 7551(J)
proton reactions (p,p'), magnetic analysis, 9: 4600(J)
shell theory for, and other A = 19 nuclei, 9: 4267(J)
spectra of Li^7F^{19}, by electric resonance molecular beam spectroscopy, 9: 5752(J)
thermonuclear reactions of protons with, in stars, 9: 3647(J)
Fluorine isotopes F^{21}
mass measurement and excited states of, 9: 7139(J)
Fluorites
(See Calcium fluorides.)
Fluoroaromatic compounds
synthesis, 9: 4743(J)
Fluorocarbon–hydrocarbon systems
theoretical energies of mixing, 9: 4744(J)
thermodynamic properties, 9: 6209(R)
Fluorocarbon polymers
preparation and properties, 9: 1487(R)
silicon-base, synthesis, 9: 5898(R)
synthesis and properties, 9: 6188(R)
synthesis of difluoroacetylene polymer by stripping, 9: 3082
Fluorocarbons
bond dissociation energies, 9: 1772(J)
Fluoroform
infrared spectrophotometry, analysis of small samples by, 9: 7697(J)
Fluorohydrocarbon polymers
preparation and properties, 9: 1487(R)
Fluoroörganic compounds
acetylation, chloromethylation, alkylation, chlorosulfonation, and iodination of tetrafluorobenzene, 9: 3082
chemistry, 9: 5282
combustion determination of C and F in highly fluorinated, 9: 2186(J)
Grignard and modified Ullman reaction of dibromotetrafluorobenzene, 9: 3082
lithium exchange reaction of diiodotetrafluorobenzene, 9: 3082
molecular electric dipole moments, 9: 547
polymerization, 9: 1487(R)
polymerization of 3,3,3-trifluoro-1,2-epoxypropane and 2-methyl-3,3,3-trifuloro-1,2-epoxypropane, 9: 1767(R)
preparation of, using electrochemical systems, 9: 4951(R)
synthesis, 9: 4091(R)
synthesis and polymerization of monomeric materials, 9: 4707
synthesis and properties, 9: 6188(R)
synthesis of 3,3,4,4,5,5,5-heptafluoro-2-pentanol, 2-methyl-3,3,3-trifluoro-1,2-epoxypropane, and 3,3,3-trifluoro-1,2-epoxypropane, 9: 1767(R)
synthesis of fluoroörganic silanes, 9: 4952

Fluoroorganic compounds (cont'd)
thermal stability, 9: 4421

Fluoroorganic polymers
physical properties and synthesis, 9: 4953
properties and synthesis, 9: 6210(R)
synthesis, 9: 1767(R), 4954
synthesis and properties, 9: 4955
synthesis and properties of fluorinated polydienes and polyacrylates, 9: 3063(R)
synthesis of fluorine-containing polyethers, 9: 7709

Fluorophotometers
design for microanalytical analysis, 9: 5100(J)
to detect uranium in urine, design, 9: 5433(J)

Fluoroplatinates
alkali, preparation and physical properties, 9: 5903(J)

Fluorothene
(See Ethylene, chlorotrifluoro- polymers.)

Fluorspars
(See also Calcium fluorides.)
acid leaching and U recovery from, from Thomas Range, Utah, 9: 159

Fluosulfonic acid
ionization in anhydrous, and formation of complex fluorides in, 9: 3416(J)

Fluxmeters
design for measurement of nuclear resonance, 9: 1618
design of bismuth wire, for measuring magnetic fields, 9: 6710

Fog
oil, sampling program, 9: 2099(R)

Foils
(See also specific foils as identified by material; see also Films; Metallic foils.)
effect of orientation on neutron-induced activity, 9: 2857(J)

Folic acid
protective effects of, against radiation injuries in guinea pigs, 9: 6583(J)

Folkston Area (Fla.–Ga.)
geophysical exploration, map of, 9: 1831(J)

Food
baking quality of flour, effect of γ radiation on, 9: 6507(R)
effects of diet of flesh from lethally irradiated animals on dogs, 9: 5227(J)
effects of γ radiation on vitamins and enzyme activity in milk, 9: 4919(J)
effects of γ radiation on storage life of onions, 9: 3735(J)
effects of irradiation on activity of proteolytic enzyme and leposidase-type enzyme systems, 9: 10(R)
effects of radiation on refrigerator and shelf storage-life and taste qualities, 9: 1550(R)
gamma irradiation of beef, nature of odors formed during, 9: 2117(J)
irradiated meat, effect of dietary on growth of rats and puppies, 9: 1156(R)
processing of, by electrons from traveling-wave linear accelerators, 9: 1369(J)
radiation processing of, effects of gases, temperature, and composition of food material, 9: 1715(J)
radiation sterilization of, industrial attitude toward, 9: 1714(J)
radiosterilization, 9: 10(R)
radiosterilization of, by γ radiation, 9: 11
radiosterilization of, review of literature, with emphasis on effects of radiation on meats, 9: 2549
sterilization by radiation, effect of free-radical acceptors, 9: 5218(J)
sterilization by radioactive waste products, 9: 1702(J)

Food (cont'd)
sterilization of, economic aspects, 9: 6821
sterilization of, induced by γ irradiation, role of radioresistance of bacterial spores, 9: 33(J)
sterilization of pork by γ radiation, 9: 493(J)

Foote Mineral Co., Philadelphia
progress reports on ground zirconium metal powder pilot plant, 9: 1853(R)

Forging
inert gas, equipment for, 9: 984(J)

Formaldehyde
determination in solutions containing HNO_3, U, and Fe, 9: 6606
yield from decomposition of methanol by Co^{60} gamma radiation and 28-Mev He ions, 9: 2202(J)
yield from decomposition of methanol–water solutions by Co^{60} gamma radiation, 9: 2203(J)

Formals
(See Acetals.)

Formamide, *N*,*N*-dimethyl-
direct fluorination, 9: 890
solubility in sodium borohydrides, chemical reactions, and optical properties, 9: 2615

Formamide, *N*,*N*-dimethyl- –boronfluoride systems
chemical and thermal properties and reduction, 9: 2615

Formamide, *N*,*N*-dimethyl- –sodium borohydride systems
electrolysis, 9: 2615

Formates
(See also Ammonium formates.)
incorporation of, in nucleic acid components, effects of injected bone marrow in rats, tracer study, 9: 1176
incorporation of, into normal and x irradiated chick embryos, tracer study, 9: 3376

Formic acid
determination in solutions containing HNO_3, U, and Fe, 9: 6606
neutralization titrations in anhydrous, 9: 523(J)
neutralization titrations of, in anhydrous pyridine, 9: 882(J)
radiation chemistry of, 9: 5571
reaction between cerium(IV) ions and, in aqueous solutions due to x-ray irradiation, 9: 3792(J)
solid γ-irradiated, paramagnetic spectra, 9: 3423(J)

Formic acid–oxygen systems
radiation chemistry, 9: 6868

Forney District (Idaho)
exploration for U and Th deposits in, 9: 1520(J)

Fort Myers Area (Fla.)
geophysical exploration, map of, 9: 1526(J)

Fort Union Formation (S. Dak.)
geology and ore distribution, 9: 7758

Fort Union Formation (Wyo.)
geology, 9: 627(J)

Fortymile District (Alaska)
geology and exploration, 9: 628(J)

Francium isotopes Fr^{221}
decay schemes and nuclear spectra, 9: 4863
radioactivity and energy levels, 9: 2500

Francium isotopes Fr^{223}
alpha radioactivity, 9: 4023(J)
separation from Ac by paper chromatography, 9: 1225(J)

Fracture tests

ductile, brittle, stress induced, 9: 7018(J)

mechanisms of crack propagation, 9: 644(J)

Franklin Inst. Labs. for Research and Development, Philadelphia.

progress reports on diffusion of Zn in Ag single crystals, 9: 7001(R)

progress reports on structure and properties of Fe powders prepared by carbonyl process, 9: 1862(R)

progress reports on study of purification and substructure formation of metals and semiconductors and the properties of high-temperature metals, 9: 1855(R)

Free Enterprise Mine Area (Mont.)

exploration and geology, 9: 1519(J)

Free radicals

influence on rate of polymerization, 9: 4936(J)

paramagnetic resonance absorption of triarylaminium perchlorates, 9: 7099(J)

French reactors

(See Saclay Reactor; ZOE Reactor.)

Frequency meters

design of r-f measurement system for Bevatron, 9: 6378

Frequency modulation

records, discrimination of, apparatus for, 9: 8005(P)

Frequency regulators

frequency generated by spin-controlled oscillators, 9: 7163

nuclear magnetic resonance apparatus for production of frequencies, 9: 353

Frey Canyon District (Utah)

mineralogy, 9: 1829

Friction

rolling, apparatus for measuring, 9: 2240(J)

stability of control systems with, locus curve method of study of, 9: 6714(J)

Frits

(See also specific materials.)

composition, preparation, properties, and testing of, for high-temperature alloy parts in nuclear reactors, 9: 2249(J)

Frogs

gamma radiation effects on ovulation, fertilization, and embryonic development in, 9: 2581(J)

Fuel alloys (liquid)

(See Reactor fuel alloys (liquid).)

Fungi

radioinduced mutations in, 9: 29(J)

Funter Bay Area (Alaska)

geology, mineralogy, and exploration, 9: 6967(J)

2-Furaldehyde–water systems

mass transfer in a horizontal liquid-liquid extraction tube, properties affecting the film coefficients of, 9: 2208

Furan, octafluorotetrahydro-

dielectric constants, 9: 6213(J)

Furnaces

control and operation of Zr reduction, 9: 5319(J)

design and performance of tungsten-coil, for x-ray diffraction investigation of phase changes and equilibria at high-temperatures, 9: 2319(J)

design of high-frequency, sintering, 9: 2740

design of micro, 9: 514

design of Verneuil, for producing inorganic crystals with high crystallization temperature, 9: 1932(J)

for diffusion and conductivity measurements, design, 9: 1283

Furnaces (cont'd)

diffusion-anneal, incorporating shear cells for study of diffusion in molten Pb–Bi systems, 9: 179

high-temperature, for x-ray-diffraction analyses, design, 9: 4822

high-temperature laboratory, bibliography and description, 9: 1213

oscillating, development of, for corrosion testing, 9: 6649(J)

Fused salts

(See also specific compounds and systems.)

activity of $CaCO_3$ in mixtures of, 9: 1744

corrosive effects on Ti, 9: 1255(J)

crystallization, effect of impurities on, 9: 5682(J)

electric conductivity, 9: 2139(J)

electrode potentials of metals in, 9: 7006(J)

electrolytic refining of U using a LiCl–KCl–UCl_3 electrolyte, 9: 6237

enthalpy and thermal capacity, 9: 1466(R), 6875(R)

heat content and heat capacity, 9: 5078(R)

heat content and heat capacity of, measurements at 30° to 900°C, 9: 4367(R)

neutral sodium electrode with zero potential for electrochemical studies, 9: 4932(J)

properties, review of, 9: 7677(J)

surface tension of solutions of, 9: 5682(J)

G

Gadolinium

determination in Zr, 9: 5890(J)

filament activation, 9: 2794

heat of combustion, 9: 4023(J)

hyperfine structure, 9: 1686(J)

polarographic studies, 9: 5602(J)

separation from rare-earth chloride mixtures, 9: 7987(P)

tissue distribution of, in rats, tracer study, 9: 3730(R)

x-ray emission spectrum, 9: 6129(J)

x-ray absorption spectra (L), 9: 4904(J)

Gadolinium complexes

with cupferron, pyrolysis, 9: 5920(J)

Gadolinium compounds

paramagnetic absorption in salts of, in parallel fields, 9: 2516(J)

Gadolinium isotopes Gd^{155}

decay schemes, 9: 988(R)

nuclear magnetic moments and spin, 9: 1686(J)

Gadolinium isotopes Gd^{157}

nuclear magnetic moments and spin, 9: 1686(J)

Gadolinium isotopes Gd^{159}

decay, 9: 7186(J), 7189(J)

fission yield of, from natural U, 9: 1700(J)

Gadolinium minerals

distribution of, in Ariz., Canada, Ceylon, Colo., Finland, Va., India, N. Mex., Sweden, Texas, and Union of South Africa (Cape Province), 9: 7335

Gadolinium nitrates

preparation of anhydrous, by reaction of oxides and NO_2, 9: 113(J)

solvent partition of, between nitric acid and tributyl phosphate, 9: 901

Gadolinium oxide crucibles

preparation and properties of, for molten Ti, 9: 2246

Gadolinium oxide–samarium oxide systems

thermal conductivity, methods of measurement, 9: 7327(R)

Gadolinium oxide–titanium systems
hardness and microstructure, 9: 2246

Gadolinium oxides
heat of formation, 9: 4023(J)
properties of, effect of molten Ti on, 9: 2246

Gadolinium sulfates
paramagnetic absorption in, in parallel fields, 9: 2516(J)

Gages
(See also Pressure gages; Strain gages; Thickness gages; Vacuum gages.)
application of radioisotopes to, 9: 1334(J)

Gallates
crystallography of rare-earth, 9: 2982(J)

Galling
and seizing, prevention of, 9: 2745(J), 2746(J)

Gallium
bremsstrahlung reactions at 320 Mev, interpretation of results, 9: 3654(J)
bremsstrahlung reactions at 320 Mev, nuclide yields from, 9: 3653(J)
colorimetric determination of, with rhodamine B, 9: 6903(J)
extraction by organic solvents from aqueous HCl, 9: 4205(R)
fluorimetric determination of, in mixtures of Al and Ga oxinates, 9: 5269(J)
hyperfine structure anomaly in atomic p-states, 9: 7136(J)
radiometric determination, 9: 2634
solubility of, in molten $GaCl_3$, 9: 3052
spectrographic determination of, in ores and rocks, 9: 162
volumetric determination, 9: 74(J)

Gallium (liquid)
solubility of Be in, 9: 5954

Gallium antimonides
Hall coefficient and resistivity, effects of radiation, 9: 5382(R)

Gallium–beryllium alloys
constitution diagrams, 9: 5954

Gallium chlorides (liquid)
solubility of Ga in, 9: 3052

Gallium iodides
preparation, phase studies, oxidation states, melting point determinations, and x-ray-diffraction powder patterns of GaI_3–GaI_2–GaI system, 9: 3053
solvent extraction of GaI from GaI_3–GaI_2–GaI system with CaH_2-dried benzene, 9: 3053

Gallium isotopes
gamma spectra of, 9: 435(J)
Szilard-Chalmers concentration, 9: 1959(J)

Gallium isotopes Ga^{67}
half life, 9: 2960(J)

Gallium isotopes Ga^{69}
electromagnetic separation, 9: 1591
magnetic moment, ratio of, to Ga^{71}, 9: 7137(J)
nuclear magnetic moments, 9: 652(R)
nuclear magnetic octupole moments, measurement, 9: 359(J)

Gallium isotopes Ga^{71}
electromagnetic separation, 9: 1591
magnetic moment, ratio of, to Ga^{69}, 9: 7137(J)
nuclear magnetic moments, 9: 652(R)
nuclear magnetic octupole moments, measurement, 9: 359(J)

Gallium oxides
heat and free energy of formation, 9: 529(J)

Gallium–titanium alloys
lattice parameter, resistivity, magnetic susceptibility, and other physical properties, 9: 5055

Gallup Area (N. Mex.)
geophysical exploration, 9: 2709
mineral determinations in U deposits and prospects in, 9: 5948(R)
mineralogy, 9: 1829

Galvanic corrosion
(See Electrochemical corrosion.)

Games theory
bibliography, 9: 4847

Gamma absorption analysis
of beryls by $Be^9(\gamma,n)$ reaction, 9: 5557(P)

Gamma absorption coefficients
graphs for various materials, 9: 2983
tables, 9: 2472

Gamma cross sections
of carbon (C^{12}) for $(\gamma,3\alpha)$ reaction, 9: 6775(J)
for π mesons from deuterium, 9: 6450(J)
photoproton production in the reaction O^{16} $(\gamma,p)N^{15}$, 9: 6070(J)
for scattering of cobalt Co^{60}, in lead, uranium and tin, 9: 6043(J)

Gamma decay
(See also subheadings regarding gamma decay and reactions under specific elements or isotopes.)
gamma-gamma angular correlation, discussion of, 9: 6467(J)
intensity rules for, to rotational states, 9: 2501
internal bremsstrahlung in 0–0 transitions, 9: 5140(J)
internal Rayleigh scattering in, 9: 3310(J)
of neutral pions, damping effect in, 9: 336(J)

Gamma Property (Nev.)
geology, 9: 6963

Gamma radiation
(See also appropriate subheadings under specific materials; see also Photons; X radiation.)
absorption, direct measurement of energy from, 9: 7462(J)
absorption by nuclei, 9: 4006(J)
accompanying electron capture, calculation of shape of spectrum of, 9: 6466(J)
angular correlation, apparatus and measurement, 9: 7893(R)
angular correlation of, from positron annihilation in light metals, 9: 4586(J)
angular correlations of pairs in multiple cascades, theorem on, 9: 4321(J)
angular correlations, theory, 9: 434
angular distribution and polarization, formulas, 9: 3324(J)
angular distribution of, from $C^{13}(p,\gamma p')C^{13}$ reaction, 9: 2455(J)
angular distribution of, from $C^{14}(p,\gamma)N^{15}$ reaction, 9: 6763(J)
angular flux of singly scattered, at source energy and single scattering cutoff, 9: 5173
from atomic bombs, effects on mice, 9: 5850(J)
from atomic explosions, pathological effects on mice compared with effects of x radiation, 9: 6825
attenuation by H_2O from a swimming pool reactor, 9: 7151
attenuation in 2π shield, 9: 2030
attenuation of, 9: 2983
backscattering in γ spectrometers, 9: 5734(J)
of barium isotopes Ba^{134}, angular correlation of, 9: 7118(J)
biological effects of, compared with effects of fast neutrons on cataract formation in mice, 9: 3(R)

Gamma radiation (cont'd)
of cadmium Cd^{114}, γ-γ directional correlation in, 9: 7117(J)
calibrator for detectors of, 9: 6405
calorimetry, 9: 1972(J)
chemical dosimetry of, Bragg-Gray relation corrections in, 9: 5446(J)
chromosome breakage following exposure to, in Tradescantia, 9: 2576(J)
from cobalt (Co^{60}), absolute measurement, 9: 1978(J)
from cobalt (Co^{60}), distribution of electron energies from, 9: 6418(J)
from cobalt (Co^{60}) teletherapy unit, integral dose measurements, 9: 1979(J)
from cobalt (Co^{60}), therapeutic uses of, 9: 7253(R)
coherent scattering of, by K electrons in heavy atoms, method for evaluating, 9: 2479(J)
in coincidence with β particles, β spectrometer for study, 9: 718(J)
decomposition of $Ba(NO_3)_2$ by, 9: 5913
decomposition of methyl alcohol–water solutions by, 9: 2203(J)
decomposition of water following exposure, 9: 2660(J)
detection and measurement, 9: 1602, 7860(J)
detection and measurement, cobalt glass and Ag-activated phosphate glass in, 9: 3932
detection and measurement, design of rate meter for, 9: 5724
detection and measurement, design of thermoluminescent dosimeter for, 9: 1964
detection and measurement, Soviet Union dosimeters for, 9: 5428(J)
detection and measurement by colorimetric determination of halogen acid released from halogenated hydrocarbon, 9: 5548(P)
detection and measurement by NaI single crystal scintillation counter, 9: 4534(J)
detection and measurement of, above 50 Mev, scintillation counters for, 9: 1053(J)
detection and measurement of, by γ spectroscopy, 9: 874(J)
detection and measurement of, from inhaled Rn, 9: 3591(J)
detection and measurement of, from Zn^{65} in animal tissues, 9: 3379(J)
detection and measurement of, in intense radiation fields, ion chamber for, 9: 3926
detection and measurement of, over a wide band of energies performance of a photographic film detector, 9: 1318
detection and measurement of, performance of dosimeters containing sensitized KBr crystals, 9: 3922
detection and measurement of, performance of instruments for, 9: 6820(R)
detection and measurement of, performance of scintillation detectors, 9: 3931(R)
detection and measurement of, performance of sensitized KBr crystals as dosimeters, 9: 4243
detection and measurement with LiF thermoluminescent dosimeter, 9: 2412(R)
detection by ortho-phenanthrolene, 9: 3267(J)
from deuteron reactions with B^{10}, B^{11}, N^{14}, C^{12}, F^{19}, and Si^{28}, 9: 379(J)
directional correlations (α-γ), increased efficiency with liquid film sources, 9: 321(J)
dosage determination, 9: 3938
dosage determination of, film-badge dosimeter for, 9: 6724
dosage determination with infrared stimulated phosphors, 9: 7863(J)
dose rate effects on survival of young chicks, 9: 6840(J)
dosimetry by alkali halide crystals, 9: 6733(J)
dosimetry, performance of chemical radiation detectors for, 9: 700
dosimetry of, using photographic film detectors, 9: 2428(J)
effects of drill hole diameter on intensity of, in geophysical prospecting, 9: 2714(J)
effects of localized exposure to, on central nervous system in monkeys, 9: 7635(J)

Gamma radiation (cont'd)
effects of repetitive exposure to, on hematopoietic system of rats, 9: 48
effects of total-body exposure to, in urine chemistry, 9: 2566(J)
effects of total-body exposure to, on respiratory quotient in burros, 9: 2572(J)
effects on aqueous solutions of sulfuric acid, 9: 5614(J)
effects on chromosomes of Tradescantia, 9: 3020(J)
effects on corrosion of metals, 9: 7755
effects on cortical function in isolated calf adrenals, 9: 1166(J)
effects on ethylene, 9: 583(J)
effects on eyes of monkeys, 9: 6162(J)
effects on fertility of mice and viability of their progeny, 9: 7613(J)
effects on insects and flour, 9: 6507(R)
effects on intact spinal cord in monkeys, 9: 4354(J)
effects on liver of white rats, 9: 834(J)
effects on luminescence from Tl-activated and unactivated NaI and CsF crystals, 9: 5109
effects on nuclear reactions (n,γ) in C_3H_7Br, 9: 5915(J)
effects on ovulation, fertilization and embryonic development in frog, 9: 2581(J)
effects on photographic film, 9: 5529
effects on pork sterilization and trichinosis cycle, 9: 493(J)
effects on proteolytic enzyme activity of beef muscle, 9: 2116(J)
effects on Ag_2SO_4 solutions, 9: 6223(J)
effects on solutions and complexes of proteins, 9: 7616(J)
effects on steroidogenesis in isolated calf adrenals, 9: 1165(J)
effects on storage life and taste of potatoes, 9: 2552(J)
effects on storage life of onions, 9: 3735(J)
effects on survival of Cl. botulinum spores and toxins produced by Cl. botulinum and staphylococci, 9: 474
effects on vitamins and enzyme activity in milk, 9: 4919(J)
emitted from oriented nuclei, properties of, 9: 6469(J)
emitted from the human body, instrumention and problems of measurement, 9: 6002(J)
energy absorption and ionization calculation for irradiation of ferrous ammonium sulfate solutions with, 9: 2201(J)
energy distribution from meson (π^0) decay, 9: 6020(J)
energy spectrum of, from fission products in spent MTR fuel assemblies, 9: 5531
external detection and measurement of, from internal dose of I^{131}, 9: 1463, 1464
from fall-out, dosage determinations and effects of environmental factors, 9: 2590
fission of U by 30, 80, and 250 Mev, 9: 6771(J)
following inelastic scattering of neutrons up to 2.2 Mev on F^{19}, 9: 7516(J)
genetic effects of chronic exposure to, in maize, 9: 28(J)
geometrical factors affecting counting of, 9: 7168(J)
ground scattering, Monte Carlo calculation, 9: 1375
high-level dosimetry of, with phosphate glass containing Co, 9: 1040
internal Rayleigh scattering of, 9: 3310(J)
from internally administered isotopes, a survey couch for use in determinations, 9: 2128(J)
from internally deposited Th in patients, measurement of total-body activity, 9: 5726(J)
isodose measurements of, over entire body following administration of 10 mc I^{131}, 9: 2605(J)
lethal dosage determinations and pathological effects on burros, 9: 5847(J)
lethal dosage determinations for mice, 9: 2547(R)
lethal dosage determinations of, for rabbits, 9: 5858(J)
lethal effects of, on Clostridium botulinum, 9: 11

Gamma radiation (cont'd)
line shape of monochromatic, in a scintillation spectrograph, 9: 435(J)
low-energy, at great depths, investigation of, 9: 6520(J)
low-energy, at great depths, mechanism for, 9: 6521(J)
from low-energy proton bombardment of Be^9, detection and measurement, 9: 5183
mapping fields of, with Ag-activated phosphate glass, 9: 3261(J)
from Materials Testing Reactor, detection and measurement, 9: 2446
meson (π^0) productions by 250 Mev, on D, 9: 6742(J), 7470(J)
mixed M_1-E_2 transitions, relation to theory of, 9: 6462(J)
Monte Carlo evaluation of single scattering integrals, 9: 2926
multiply scattered, angular distribution of, 9: 5793(J)
narrow beam absorption coefficients, 9: 7565(J)
natural, in West Cumberland Area of England, 9: 6515(J)
neutron production by 250 Mev, on Li, Be, C, Al, Fe, Cu, and Pb, 9: 6772(J)
from neutron (n,γ) reactions in aircraft alloys, tables for, 9: 6508
from nuclear explosion, late pathological effects on mice, 9: 21(J)
oxalic acid decomposition by, and possible use as dosimeter, 9: 6929(J)
pair production by, conversion of intermediate-image-focusing β spectrometers for detection of, 9: 311(J)
from palladium (Pd^{103}), characteristics of, 9: 6110(J)
pathological effects of chronic exposure to, on mice, 9: 2563(J)
penetration and diffusion in H_2O, 9: 3677(J)
penetration and dose rates in H_2O and Hg of Na^{24}, 9: 6783
penetration calculations and transport theory, 9: 2472
penetration of 6-Mev, in Pb and Fe, 9: 1656
performance of G-M tubes under intense, 9: 7869(J)
physiological effects of chronic exposure to, on burros, 9: 1156(R)
polarization of, following polarized neutron capture, 9: 7505(J)
from polonium neutron sources, 9: 4593(J)
from polonium neutron sources, detection and measurement, 9: 3929
polymerization of acrylamide following exposure to, 9: 4958(R)
polymerization of n-vinylpyrrolidone by exposure to, 9: 1781(R)
probability for emission of, from S-particle decay, 9: 1061(J)
production by nuclear Coulomb excitation, 9: 4903(J)
production of polymer methyl methacrylate with, 9: 5916(J)
production of unconditioned stimulus in rats with, 9: 5851(J)
protection against, handbook, 9: 1452(J)
from proton capture in Be^9, 9: 4576(J)
radiosterilization of cheese, 9: 474
from radium and K^{40}, detection and measurement of, in vivo in human skeleton, 9: 1980(J)
from reaction D(p,γ)He^3, 9: 7942(J)
reaction of 19.0 to 30.5 Mev, with Cu, angular distribution and yield, 9: 5508(J)
relative biological effectiveness of, in mammalian systems, compared with effects of other radiations, 9: 3007
resistance of bacterial spores to, 9: 33(J)
resonance scattering of, by nuclei, 9: 783(J)
scattered, from a Co^{60} beam therapy unit, detection and measurement, 9: 3129(J)
scattering by air, spacial distribution of, 9: 1104
scattering by nuclear electric fields, 9: 4610(J)
scattering by nucleons, calculation of cross section for, 9: 426(J)
scattering by shadow shield, 9: 2027
scattering of Co^{60}, by air and ground, 9: 6093
scattering of 0.32 mc^2, in Hg, calculation, 9: 2480(J)
from slab of contaminating material, detection and measurement, 9: 3935
simultaneous counting of, from Na^{24} and K^{42}, 9: 2429(J)
from Na^{24}, detection and measurement in body fluids, in the presence of β particles from K^{42}, 9: 1465(J)
somatic mutations produced by chronic exposure to, in carnations, 9: 4044
spectral and angular distribution of secondary, in matter, 9: 2490(J)
sterilization of beef by exposure to, nature of odors formed during, 9: 2117(J)

Gamma shielding
(See also appropriate subheadings and under the device or material shielded.)
nomographs, 9: 2983
partial, mathematical analysis of, 9: 2076
tenth-value thickness, graph, 9: 7565(J)

Gamma sources
(See also X-ray sources.)
applications of, in radiotherapy of tumors of the bladder, 9: 6851(J)
calibration of Co^{60}, for animal exposure, 9: 7186
calibration of, performance of γ spectrometers, 9: 5424
calibration of, using Co^{60}, 9: 271
catalog of, 9: 246(J)
cesium (Cs^{137}), for teletherapy, design problems in, 9: 6849
cobalt (Co^{60}), for irradiation of large animals, design, 9: 5680
cobalt (Co^{60}), intracavitary administration, 9: 6169(J)
cobalt (Co^{60}), standardization, 9: 6444(R)
consisting of Co^{60} beads, dosage determinations, 9: 6586(J)
consisting of radiocobalt spheres in a suspension, application in intracavitary radiotherapy, 9: 6167(J)
containing Co^{60}, conversion of a radium beam unit for housing, 9: 2125(J), 2126(J)
containing Co^{60}, design and handling, 9: 3923
containing Ta^{182}, in irradiation of tumors, 9: 5242(J)
design, employing Co^{60}, for giving uniform doses of 75 to 4,000 r/min to small animals, 9: 6562
design and calibration of 100-c Co^{60}, 9: 3896(J)
design and cost factors for, using Cs^{137}, mixed fission products, and cooling reactor fuel elements, 9: 1550(R)
effectiveness of Co^{60} in, for interstitial, intracavitary, and plaque radiotherapy applicators, 9: 843(J)
field irradiation Co^{60} machine, 9: 7571(J)
high dose rate, for small specimens, design, 9: 2067(J)
for high-temperature underwater irradiation facility, design, 9: 4621(J)
for irradiating pork, potatoes, and packaged meats, 9: 6507(R)
kilocurie Co^{60}, plans and designs for, 9: 5976
low-level γ room for biological experiments, calibration, 9: 2547(R)
multikilocurie, handling, 9: 4504(R)
operational problems during routine use of 10-kc, 9: 432(J)
optical system for viewing 2000-C Co^{60}, 9: 7390
photoelectron angular intensity distributions from various, 9: 4310(J)
precise positioning of, for calibration of detectors, 9: 1602
preparation, remote-control equipment for, 9: 572(J)
preparation of, and experimental studies, conference, 9: 3807(J)
preparation of, from radioactive Co, La, and Ce–Pr absorbed on clay, 9: 658
radiation dosages from MTR γ irradiation facility, 9: 2050

Gamma sources (cont'd)
for radiotherapy, using Co^{60}, design, 9: 497(J)
rotating telecobalt, dose distribution and protection requirements, 9: 1726(J)
for treatment of cervical carcinoma, dosimetry, 9: 4052(J)
use of, in liquid metal level indicator, 9: 5990
using spent MTR fuel assemblies, gamma decay spectrum, 9: 5531
utilizing Co^{60}, calibration, 9: 7464(J)
utilizing fission products, design, 9: 7028

Gamma spectra
calculations, tables, and graphs, 9: 2472
Coulomb excitation of Te^{123}, Te^{125}, Ag^{107}, Ag^{109}, 9: 6444(R)

Gamma spectrometers
backscattering in single-crystal, 9: 5734(J)
calorimetric, for absolute measurements during β decay, 9: 1972(J)
conversion-electron spectral lines in, width of, 9: 5432(J)
count-rate meters and pulse analyzers, design, 9: 696
description of, 9: 1970(J)
design, 9: 5115
design for directional correlation measurements, 9: 7893(R)
design for fission spectra, 9: 7957
energy resolution of multiple-crystal, 9: 1067(R)
fluctuations in pulse energies, calculations on, 9: 1963
high-luminosity sector-type, design, 9: 1969(J)
lead glass plate, efficiency of, calculations on, 9: 1962
line shape of monochromatic γ radiation in scintillation, 9: 435(J)
pair, design of high-energy, 9: 336(J)
performance, 9: 1133
performance of, for determination of total fission products, 9: 3264(J)
performance of, in calibration of γ sources, 9: 5424
performance of, in radiochemical analysis, 9: 874(J)
scintillating crystals for, performance, 9: 1597
scintillation, design and performance, 9: 7867(J)
scintillation, effect of temperature on response of, 9: 7456
scintillation, influence of distance between source and crystal on detection efficiency of, 9: 4533(J)
scintillation, with logarithmic pulse-height response, 9: 7873(J)
utilizing pair production, design, 9: 5505(J)

Gamma spectroscopy
analytical uses of, in radiochemical analysis, 9: 874(J)
book, 9: 4902(J)
chemical analysis by, 9: 7449

Gardner Area (Fla.)
geophysical exploration, map of, 9: 1832(J)

Gas analyzers
design and operation of, for binary gas mixtures, 9: 7053(J)
design and performance of dual ionization gage for, 9: 2820(R)
isotopic, applied to determination of isotopes of C and H, 9: 2180(J)

Gas flow
(See also Compressible flow; Convection; Incompressible flow; Liquid flow; Stack disposal; Subsonic flow; Supersonic flow; Transonic flow.)
air, characteristics of hot-wire anemometers for measurement of, 9: 6703
air mass-flow rate meter for, 9: 7431
approximation method for plane, mathematical analysis, 9: 6701
boundary layer control by porous suction, theory, 9: 2695
coefficient of resistance in, at near sonic velocities, 9: 2233(J)

Gas flow (cont'd)
control, for aerosol sampling unit, equipment design, 9: 3721
in cylindrical tubes with constriction, 9: 5941(J)
heat transfer, effects of recirculating or vortex-like motion on, 9: 3111
heat transfer and friction coefficients for, 9: 5633
measurement, design and calibration of a microflowmeter for, 9: 2681
measurement of air flow by traversing a duct, 9: 5938
measurement of velocity of, with hot-wire anemometers, 9: 3130(J)
rate measurement by use of porous medium, 9: 4432
selection of graphs for use in calculations of compressible air flow, 9: 3139(J)
supersonic axisymmetric, high-speed computing machine calculation of, 9: 4765
visualization by glow discharges, 9: 4430, 4431

Gas flow (laminar)
boundary layer in, mathematical analyses, 9: 3450
in capillaries of noncircular cross section, measurement, 9: 4127

Gas flow (turbulent)
aerosol coagulation and settling in, theory, 9: 2359(J)
boundary layers in adverse pressure gradients, momentum distribution, 9: 2693
influence of compression shock and boundary layers in, 9: 1014(J)
measurements in boundary layers, methods, 9: 2693
momentum terms in pipe flow, experimental evaluation, 9: 2694

Gas Hills Area (Wyo.)
occurrence of unoxidized U deposits in, mineralogy of, 9: 5948(R)
stratigraphy, exploration, U distribution, and geology, 9: 1261(J)

Gas mask canisters
(See also Filters.)
containing silica gel, or activated carbon, efficiency for protection against diborane, pentaborane, and decaborane, 9: 53

Gas–metal systems
bibliography, 9: 963

Gaseous diffusion plants
control and development laboratory facilities, 9: 898

Gaseous discharge
(See Electric arcs.)

Gaseous ions
energy loss in gases of positive single scattered, 9: 1377(J)
ionic species formed in gases by collision with, 9: 1378(J)
ionization and overchanging of 5 to 30 kev, in gases, 9: 2383(J)
ionization potentials, calculation, 9: 7285(J)
oscillations in halogen-quenched G-M counters, mechanism and effects of A additions on, 9: 309(J)

Gaseous reactions
homogeneous, unimolecular, mechanism for, 9: 7440(J)
mechanisms, kinetics, 9: 6874

Gases
(See also Rare gases.)
absorption and scattering of beta particles in, 9: 6820(R)
activated diffusion in pressed adsorbents, 9: 4755(J)
adsorption, diffusion, and flow properties of, 9: 7022
adsorption, on TiO_2, 9: 4366
adsorption of, on the surface of a solid, quantum theory, 9: 3433(J)
analyses of, by α-ionization techniques, design and performance of apparatus for, 9: 7053(J)
analysis of mixtures by sonic method, 9: 4085(J)
application of intense corpuscular electron beams for excitation of, design and performance of apparatus for, 9: 2477(J)
atomic, optical properties when near resonance, 9: 6370

Gases (cont'd)
beta absorption analysis, 9: 6901(J)
capture and loss cross sections for ions of Z = 8 to 18, 9: 5808(J)
charge distribution of O and Ne ions passing through, 9: 5807(J)
charge states of heavy-ion beams passing through, 9: 992(J)
collision processes in, model for, 9: 5398
concentration of ions as a function of pressure in thermally ionized, 9: 6702
cooling by emission of radiation, theoretical analysis, 9: 2381
complex molecules of, effects of equilibrium pressure and vaporization rate measurements, 9: 2823(J)
design and performance of apparatus for continuous detection and measurement of low concentrations of O_2 in, by dew-point methods, 9: 2636(J)
design and performance of semiautomatic separation equipment for, 9: 2211(J)
density measurement with particle beam probes, 9: 1940(J)
detection of hydrogen in, 9: 4075
determination of, in metals by a vacuum fusion method, apparatus for, 9: 3406(J)
dielectric properties, 9: 1368
diffusion through base coat glasses, 9: 616
dissociation energies of, 9: 2437
dual ionization gage for, design and performance, 9: 2820(R)
dynamic pressure stage elements for projection of intense monokinetic corpuscular beams into, at high pressure, design and performance of equipment, 9: 2475(J)
electric breakdown in, departure from Paschen's Law, 9: 2376(J)
electric discharge in, on a-c current at audio frequencies, striking and maintaining, 9: 7045(J)
electric discharge in, oscillographic study, 9: 5093(J)
electrochemical determination of traces of O, 9: 2631
electron, kinetics of magnetization of classical, 9: 5399(J)
electron loss cross sections for helium atoms passing through, 9: 6700(J)
energy exchange between, and graphite at elevated temperatures, 9: 5908(J)
energy transfer between, theory, 9: 3571(J)
flow rate and viscosity measurements by diffusion through a porous medium, 9: 4432
gas chromatographic separation and analysis of, 9: 2672(J)
heavy, ionization in, 9: 4911(R)
high-frequency discharge in low-pressure, 9: 3567(J)
imperfect, characteristics, 9: 3911(J)
ionization and overcharging of 5 to 30 kev gaseous ions in, 9: 2383(J)
ionization of, by α and β particles, 9: 2539(R), 3899(J)
ionized, behavior in a magnetic field, 9: 1941(J)
kinetic equation for excitations of weakly interacting nonideal, 9: 3572(J)
kinetics, symmetry effects in, 9: 5701(J)
mass spectrographic analysis of noncorrosive, 9: 3583
mass spectrographic analysis of noncorrosive, measuring techniques, 9: 3584
mass spectrographic determination of trace vapors in, 9: 6193
microwave spectroscopy of, review of recent advances, 9: 3347(J)
mixing of accurately blended samples of, equipment, 9: 3570
multiple scattering of α particles by, 9: 6791(J)
nonmaxwellian theory of homogeneous and anisotropic, 9: 1016(J)
to operate atomic rockets, thermodynamics, 9: 4772(J)
poisonous, maximum allowable concentrations in USSR industrial establishments, 9: 4687(J)

Gases (cont'd)
prevention of mists in condensed, 9: 855(J)
radiometric analysis of, techniques and equipment, 9: 300
separation by diffusion through membranes, 9: 685(J)
solidified, compressibilities at low temperature, 9: 2824(J)
solubility of, in liquids, instrument for, 9: 3068
Stark fields from ions in a plasma, 9: 5404
temperature and ionization in spark discharge, 9: 6356(J)
temperature measurements on, probe design, 9: 3578
theoretical and experimental study of perfect gas and equation of state of real gases, 9: 1576(J)
thermal conductometric analysis of, for water vapor, instrument for, 9: 99
thermal diffusion of, evaluation of Lennard-Jones 12:6 model for, 9: 7842(J)
thermal relaxation in, solution of linearized equations for sound dispersion in, 9: 3240(J)
thermodynamic properties, graphical method for obtaining, 9: 7840
ultraviolet emission in N_2, O_2, and H_2 by α bombardment, 9: 3241(J), 5405(J)

Gasket materials
stress relaxation of, testing, 9: 3140
use of indium in, 9: 5407

Gastrointestinal tract
absorption from, effects of whole-body irradiation on, in rats, tracer study, 9: 5209
absorption of Pu by, effect of concentration of Pu in diet on, 9: 501
effects of radiation on, in rats, 9: 5849(J)
plutonium absorption from, comparison between rats and pigs, 9: 1703

Geiger-Mueller tubes
(For detection instruments using Geiger-Mueller tubes see also Radiation detection instruments (pulse type).)
analysis of spurious pulses of, by method of delayed coincidences, 9: 6424(J)
bromine-quenched and iodine-quenched, design, 9: 3259(J)
characteristics of chlorine-quenched, 9: 4523(J)
coincidence corrections for, used with a-c x-ray equipment, 9: 6417(J)
containing methylal and ethanol, temperature coefficient of, between 20 and 240°C, 9: 6009(J)
corona threshold and range of velocities of pulse spread in, 9: 2423(J)
for counting liquid samples, stability of calibration, 9: 2869(J)
dead time in, distribution, 9: 717(J)
design and performance, 9: 1041
design for β-active liquids, 9: 2856(J)
design for C^{14} counting, 9: 7073(J)
detection of cosmic neutrons with Be shell, 9: 7857(J)
detection of ultraviolet radiation by photosensitive, 9: 5441(J)
discharge in, with ethyl and iso-amyl alcohols, cloud chamber study of, 9: 1332(J)
effect of the semi-proportional region on counter threshold, 9: 1973(J)
efficiency of mica-window, as function of electrode geometry, 9: 1608
electrical characteristics, changes in, 9: 2863(J)
halogen-filled, effects of circuit loading on oscillations in, 9: 7879(J)
halogen-quenched, mechanism for production of oscillation in, 9: 309(J)
halogen-quenched, performance, 9: 4842(R)
ionic multiplication coefficient of, filled with pure CO_2 or CO_2-alcohol mixture, 9: 719(J)
performance of, with external cathode, 9: 317(J)
performance under intense γ radiation, 9: 7869(J)
plateau region in, mechanisms for termination of, 9: 4537(J)
radial sensitivity of Cl-quenched, using point millicurie sources, 9: 292

Geiger-Mueller tubes (cont'd)
refilling, procedure for, 9: 5722
restitution time, measurement, 9: 3597(J)
sensitive volume of, with external cathode, 9: 5737(J)
testing equipment for electric properties, 9: 2850
time-lag in, 9: 2849
window covering material, 9: 4705(R)
x-ray counting efficiency, 9: 4524(J)

Gelatin
phase transformations in structure of, for nuclear emulsions, 9: 4521(J)

General Electric Co., Research Lab., Schenectady, N.Y
progress reports on deformation and fracture of metals, 9: 3865(R)
progress reports on development of Zr-base alloys, 9: 190(R), 3180(R), 5058(R)
progress reports on research in physical metallurgy, 9: 188(R), 1864(R), 3867(R), 7352(R)

General Electric Co. General Engineering Lab., Schenectady, N. Y.
progress reports on nondestructive inspection of adhesive bonded metal sheet, 9: 167(R), 1263(R)

General Mills, Inc., Minneapolis
progress reports on fine grinding project, 9: 3720(R)

Genetics
effects of radiation on populations, 9: 5226(J)
long-range hazards from radioinduced mutations, 9: 7248(J)
radioinduced mutations in man, 9: 4923(J)
radioinduced mutants in peanuts, 9: 7628(J)
role of recombination in, symposium, 9: 6153(J)
synthetic lethals in Drosophila, 9: 7606

Geochemical prospecting
application of paper-chromatographic methods of analysis to, 9: 3404(J)
paper chromatographic determination of trace metals in ores, 9: 2264(J)

Geochemistry
book, 9: 2715(J)
review of isotopic variations due to geochemical processes, 9: 7851(J)
techniques and data in, 9: 6962

Geological Survey
progress reports on radioactive deposits, 9: 5326(R)

Geology
(See also Tracer techniques (geology).)
age determinations by K^{40} decay, mass-spectrographic method, 9: 7336(J)
age estimation by mass spectrometric determination of argon, 9: 5337(J)
age estimations on geological formations by determination of radioactive argon, 9: 7760
isotope, book on, 9: 5950(J)
nuclear, book on, 9: 2715(J)
radioactive phenomena, survey, 9: 2710(J)
radioactivity as an aid in study of, 9: 2265(J)
theoretical effects of diffusion on isotopic abundance ratios in rocks and associated fluids, 9: 3464(J)
tracer techniques applied to age determinations in, contribution of bound β decay, 9: 953(J)

Geophysical prospecting
(See also appropriate subheadings under minerals sought; see also Rock drilling.)
application of radioactive methods in, 9: 7777(J)
car-mounted equipment for, 9: 1521(J)

Geophysical prospecting (cont'd)
effects of drill-hole diameter on γ-ray intensity in, 9: 2714(J)
geological studies of U–V sandstone deposits by, 9: 2266(J)
by nuclear methods, book, 9: 2715(J)
theory of, with electromagnetic fields, 9: 1258(J)

Geophysics
age and origin of earth and natural radioactivity, book, 9: 2715(J)
radioactive phenomena, survey, 9: 2710(J)

Georgia (Charlton Co.)
map of geophysical exploration of Folkston area in, 9: 1831(J)

Georgia Inst. of Tech., Atlanta. Engineering Experiment Station
progress reports on wetting effects on boiling heat transfer, 9: 6246(R)
progress reports on surface properties of fine particles, 9: 56(R), 3904(R)

Germanium
bremsstrahlung reactions at 320 Mev, interpretation of results, 9: 3654(J)
anion exchange of, in HCl solutions, 9: 6935(J)
bremsstrahlung reactions at 320 Mev, nuclide yields from, 9: 3653(J)
electric breakdown due to ionization of impurity atoms, 9: 4210(R)
effects of fast-neutron irradiation of n-type, 9: 5812(J)
ion bombardment cleaning of, determined by electron diffraction, 9: 778
lattice constants, 9: 3408
metabolism of, as a substitute for B, by plants, 9: 3(R)
neutron bombardment of p-type, 9: 7181(J)
nuclear isomers, 9: 1067(R)
occurrence in coalified wood from upper Devonian blackshale in Tenn. and Ohio, 9: 6277(J)
proton stopping cross section, 9: 2026
radiation effects, conductivity, and energy level studies, 9: 5382(R)
radiochemical determination, 9: 876
resistivity and Hall constant at low temperature, 9: 5077
spectrographic determination of, in ores and rocks, 9: 162

Germanium alkyl aryls
thermal stability, 9: 4421
viscosity, 9: 5681(R)

Germanium alkyls
thermal stability, 9: 4421

Germanium–aluminum alloys
creep, activation energies for, 9: 5961

Germanium–antimony alloys
phase studies, 9: 3184(J)

Germanium aryls
thermal stability, 9: 4421

Germanium–bismuth alloys
phase studies, 9: 3184(J)

Germanium crystals
electric conductivity, effects of neutron irradiation on, 9: 1042

Germanium–germanium oxide systems
phase studies and thermal analysis, 9: 7676

Germanium–iron alloys
phase studies, 9: 3184(J)

Germanium isotopes Ge^{71}
orbital electron L to K capture ratio, 9: 2070(J)

Germanium isotopes Ge^{73}
Coulomb excitation functions and energy levels for, bombarded with 3.5-Mev α particles, 9: 423(J)

Germanium isotopes Ge^{75}
decay, 9: 7131(J)
decay of the 49-sec isomer of, 9: 1673(J)
Germanium isotopes Ge^{77}
decay of ground state and 52-sec isomer of, 9: 1673(J)
decay schemes, 9: 988(R)
Germanium–nickel alloys
phase studies, 9: 3184(J)
Germanium oxide–germanium systems
phase studies and thermal analysis, 9: 7676
Germanium oxides
heat and free energy of formation, 9: 529(J)
Germanium oxides (liquid)
surface tension, 9: 7752(R)
Germanium–titanium alloys
preparation, constitution diagrams and heat treatment, 9: 6297(J)
Germanium–zirconium alloys
phase studies and constitution diagrams, 9: 5956
Getchell Mine (Nev.)
geology, 9: 6963
Glass
(See also Borosilicate glass; Cobalt glass; Optical systems; Phosphate glass; Sodium silicate glass.)
bonding with metals, theory, 9: 6646(R)
bonding to Al, method and testing, 9: 4123
coatings, permeability of base coat, to He, 9: 615
effects of radiation on, 9: 1118, 6868
effects of radiation on coloration of, control by various elements, 9: 2051
effects of radiation on surface properties of, 9: 2052(J)
fabrics, adhesion to silicone rubber, 9: 4114(R)
microporous, infrared spectra of gaseous organic compounds adsorbed on, 9: 7732(J)
porous vycor, pore size and pore size distribution in, calculation from adsorption isotherms, 9: 2216(J)
radiation-sensitive, preparation and properties, 9: 2945(R)
scattering of molecules from surface of, 9: 650
soda-lime-silica, thermal conductivity, 9: 2793(R)
structure, effects of intense neutron irradiation on, 9: 4010
Glass filters
constructed of fine glass fibers, efficiency in collection of aerosols, 9: 7744
design and performance of, for uranium oxide fumes, 9: 6945
Glass foils
preparation and properties of thin, 9: 649
Glass wool filters
design and efficiency of, for hot-lab air, 9: 560(J)
for hot exhaust air from hoods and gloved boxes, performance, 9: 549
Glen Canyon Group
stratigraphy, 9: 5327(J)
Glen Canyon Group (Colo.)
geology of, in Horse Range Mesa Quadrangle, 9: 7775(J)
Glorieta District (N. Mex.)
mineralogy and exploration of, 9: 955(J)
Glove boxes
(See Dry boxes.)
Glow discharges
nitrogen, use in gas flow visualization, 9: 4430
Glow discharges (cont'd)
observation of magnetic lines of force by means of, 9: 7397(J)
outgassing of vacuum systems by, 9: 6352
study of, for flow visualization, 9: 4431
Glucose
biosynthesis of C^{14}-labeled, 9: 2105(J)
linkage of, in coliphage nucleic acid, 9: 870(J)
metabolism of, in Co^{60}-irradiated mice, 9: 61(R)
metabolism of, tracer study, 9: 7669(J)
synthesis of, by reduction of aldonic lactones, 9: 3117
synthesis of C^{14}-labeled, 9: 7314
synthesis of C^{14}-labeled, by reduction of aldonic lactones, 9: 3117
cose (labeled)
oxidation of, in virus-infected mice, 9: 6863
Glucuronic acid
decarboxylation of lactone of, by in vitro systems, 9: 7717(J)
Glucuronic acid, sodium salts
synthesis of C^{14}-labeled, 9: 7314
Glutathione
luminescence of, under high-energy γ irradiation before and after 50 kv x irradiation, 9: 1763
metabolism of radioactive, in x irradiated and nonirradiated mice, 9: 15
protective effects of, against radiation effects on catalase, 9: 2199(J)
Glycerides
metabolism, 9: 2099(R)
metabolism of, in rats, tracer study, 9: 6173
Glycerol
metabolism of, in rats, tracer study, 9: 6173
temperature effects of positron annihilation in, 9: 6792(J)
Glycine
aqueous solutions of, effects of radiation on, 9: 5918(J)
metabolism of, by E. coli, tracer study, 9: 2547(R)
metabolism of, in Co^{60}-irradiated mice, 9: 61(R)
radiation chemistry, 9: 2551(R)
radiolysis of, 9: 7232(R)
Glycogen
metabolism of, in irradiated rats, 9: 7233
of rat livers, effect of irradiation on incorporation of C^{14}, 9: 5852(J)
Goddard Hot Springs Area (Alaska)
geology, mineralogy and exploration, 9: 6967(J)
Gold
adsorption of $AgNO_3$, Ag_2SO_4, and KCl on, 9: 3766
alpha scattering, 9: 7903
bremsstrahlung differential cross sections produced in, by 1-Mev electrons, 9: 427(J)
catalytic properties of metallic, in γ ionization of Ag_2SO_4 solutions, 9: 6223(J)
charge equilibrium ratios for H ions from proton bombarded, 9: 2486(J)
compressibility parameters and Grüneisen's constants, 9: 1863
cross sections for neutron transmission and multiplication, 9: 3646(J)
differential neutron elastic scattering cross sections at 4.1 Mev, 9: 4597(J)
effects of 12-Mev deuterons on, near 10°K, 9: 2946(J)
elastic scattering and angular distribution of 48.2-Mev α particles by, 9: 7140(J)
elastic scattering of 40-Mev α particles from, 9: 7132(J)
elastic scattering of 22-Mev α particles from, 9: 2937(J)

Gold (cont'd)
electric properties of, for nuclear batteries, 9: 266
electrical resistance of cold-worked, recovery, 9: 3861
electrodeposition of Po on, 9: 6601(J)
electron and positron scattering by, at 0.7 and 1.4 Mev, 9: 4611(J)
electron emission from, bombarded by hydrogen ions, 9: 250(J)
electron energy loss in, 30 kev, 9: 6366(J)
electron scattering, characteristic energy loss, 9: 7949
electrons scattered by, distribution of, 9: 6699(J)
emission of secondary electrons (∂ rays) by 1.3-Mev electron bombardment, 9: 1306(J)
gamma ray yields from Coulomb excitation, 9: 6052(J)
heat of solution, in liquid Sn, 9: 4178
lattice defects and electrical resistivity, 9: 2330
neutron absorption cross sections, 9: 5762
neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)
neutron total cross section, 9: 297
proton differential cross section, 9: 2890(R)
proton fission cross sections at 450 Mev, 9: 7552(J)
proton reactions and radiochemical study, 9: 4864
proton reactions (p,n), angular distributions and yields at 23 Mev, 9: 4290(J)
proton stopping cross section, 9: 2026
radiochemical determination, 9: 876
range-velocity relation for fission fragments, 9: 1365(J)
scattering of 0.6-, 1.0-, and 1.7-Mev electrons from, 9: 2485(J)
secondary electrons from, for primary electrons of 20 kev to 1.3 Mev, 9: 5989(J)
self-diffusion coefficient in, 9: 5348(R)
slow neutron cross sections, 9: 1391(J)
three-quantum annihilation of positrons in, 9: 249(J)
wetting with sodium silicate glass, 9: 6646(R)

Gold Butte District (Nev.)
thorium distribution, 9: 1260(J)

Gold–cadmium alloys
cubic to orthorhombic diffusionless phase changes in, 9: 3885(J)
diffusionless phase transformation, crystal structure, electric conductivity, thermal expansion, ferro-elastic behavior, effects of shear, bending, compression and tensile stresses, and heat treatment, 9: 1861(R)
elastic properties of, temperature dependence, 9: 5054
electrical resistivity, effect of quenching, 9: 5382(R)
partial vapor pressure of Cd and thermodynamic properties, 9: 4454

Gold compounds
polarographic behavior of, in molten ammonium formate, 9: 7292

Gold–copper alloys
electrolytic polishing, etching, and grain structure, 9: 2765(J)
energy relations in, colorimetric investigation of, 9: 2764(J)
electrical resistance at low temperature, 9: 5072(J)
ordered, electron diffraction study of, 9: 205(J)
x-ray-diffraction analysis of Cu_3Au, 9: 7567

Gold–copper alloys (liquid)
thermodynamic properties, 9: 188(R)
thermodynamic properties and phase studies, 9: 5662

Gold fluorides
preparation and heat of formation, 9: 2158(J)

Gold foils
neutron flux depression, 9: 3291(J)
preparation of, for use as radiation absorbers, 9: 7453

Gold isotopes Au^{187}
decay chain, 9: 5534(J)

Gold isotopes Au^{193}
existence of a 3.8-sec isomer of Au^{193m}, 9: 4017(J)
metastable states, 9: 7128(J)

Gold isotopes Au^{194}
decay scheme, 9: 7893(R)

Gold isotopes Au^{195}
electron capture decay of, to Pt^{195}, 9: 387(J)
energy levels, 9: 1409(J)
metastable states, 9: 7128(J)

Gold isotopes Au^{197}
alpha elastic scattering cross section at 27.5 Mev, 9: 7561(J)
fission cross sections for 380-Mev neutrons, 9: 5156(J), 5674(J)
gamma rays from Coulomb excitation, angular distribution of, spin sequence from, 9: 6053(J)
metastable states, 9: 7128(J)
neutron resonance cross sections for, calculated from many-level formula, 9: 6032(J)
neutron resonance in at 4.906 ev, parameters for, 9: 4556(J)
proton elastic scattering cross section at 7.8 Mev, 9: 7561(J)
proton excitation of, γ radiation and energy levels from, 9: 781(J)

Gold isotopes Au^{198}
capture cross section determined by spectrochemical analysis, 9: 2534(J)
colloidal, in treatment of effusions associated with carcinomas, 9: 1175(J)
colloidal, therapeutic uses in therapy of serous effusions arising from cancer, 9: 3041(J)
colloidal, with and without Ag-coating, localization following injection in brain, 9: 1172(J)
colloids, tissue distribution and toxicology of, in rats and dogs, 9: 3041(J)
colloids of, carcinogenicity, 9: 18
colloids of, dispersed in brine, tissue distribution and retention following intraperitoneal application, 9: 6591(J)
colloids, in radiotherapy of effusions associated with carcinomatosis, 9: 7649(J)
colloids of, in treatment of ascites associated with endothelioma, 9: 4682(J)
colloids of, optimum sites of injection and lymph node concentration of, 9: 1457(J)
colloids of, preparation and tissue distribution in animals, 9: 1459(J)
colloids of, tissue distribution of, effects of pre-treatment with choline and x radiation on in rats, 9: 6574(J)
combined with radium, in therapy of carcinoma of cervix uteri, dosimetry, 9: 5872(J)
effects of pre-treatment with, on growth of transplanted tumors in rats, 9: 6578(J)
gamma spectra of, 9: 435(J)
half life, 9: 2960(J)
infusion of colloidal, equipment, 9: 2604(J)
particles, implants of, use in therapy of brain tumors, 9: 2127(J)
pathological effects of large doses of intraperitoneally administered colloids of, in dogs, 9: 4673(J)
therapeutic uses of, for carcinoma of ovaries, pleura, and peritoneum, 9: 1162(J)
thermal neutron capture cross section, 9: 6764(J)
treatment of carcinoma of prostate with, 9: 4680(J)

Gold isotopes Au^{199}
decay, L Auger yield during, 9: 6538(J)
half life, 9: 6764(J)

Gold–nickel alloys
calorimetric measurements during precipitation in, 9: 4818(J)
enthalpy change and strain energy in formation of solid solutions of, 9: 187
entropy, 9: 188(R)

Gold–nickel alloys (cont'd)
entropy of solution for, measurements, 9: 1864(R)
Gold oxides
heat and free energy of formation, 9: 529(J)
Gold–silver alloys
absorption spectra (L), 9: 5674(J)
stored energy in, by drilling, filing, torsion, wire-drawing, and rolling at room temperature and 78°K, 9: 3177(R)
thermodynamic properties and phase studies, 9: 5662
Gold–silver alloys (liquid)
Gibbs free energy and enthalpy of solution, 9: 3867(R)
thermodynamic properties, 9: 188(R)
Gold–silver couples
surface diffusion, determination of the coefficients of, 9: 5658(R)
surface diffusion coefficients of, methods for determination, 9: 3848(R)
Gold–thorium alloys
radiation damage by deuterons and protons, 9: 5959
Gold–uranium alloys
phase studies of, by thermal, metallographic, and x-ray methods, 9: 1147(J)
Golovin Bay Area (Alaska)
mineralogy and U distribution in, 9: 1523(J)
Gonads
effects of total-body irradiation on, in male mice, 9: 5217(J)
effects of x radiation on, in mice, 9: 2554(J), 2557(J)
radiation dose to, during routine radiography, 9: 5869
uptake of yttrium chlorides following intraprostatic injection in dogs, tracer study, 9: 3378(J)
Goniometers
modification of commercial x-ray, for neutron diffraction measurements, 9: 2413
Goodrich (B.F.) Co. Research Center, Brecksville, Ohio
progress reports on inorganic polymer systems, 9: 6873(R)
Goodsprings Mining District (Nev.)
uranium distribution and geology, 9: 1260(J)
Goodyear Atomic Corp., Portsmouth, Ohio
control and development laboratory facilities, 9: 898
Goose Creek District (Idaho)
radioactive carbonaceous shale and lignite deposits, 9: 2263
Goulder Goulch Claim (Calif.)
geology, 9: 3837(J)
Grain-boundary diffusion
in aluminum–copper couples, 9: 971(R)
anisotropy of, 9: 1285(J)
Grain growth
of aluminum alloys, discussion of, 9: 6317(J)
effects of particle size on, of sintered Ag powder, 9: 2318(J)
exaggerated, during extrusion, 9: 1545(J)
Granite Mountain Area (Alaska)
mineralogy and U distribution in, 9: 1523(J)
Granites
alpha radioactivity in, 9: 445(J)
distribution of α activity in Wisconsin, 9: 4995
Grant View Hot Spring (Nev.)
exploration, 9: 1260(J), 1516(J)
Grants Area (N. Mex.)
mineral determinations in U deposits and prospects in, 9: 5948(R)
Grants District (N. Mex.)
mineralogy, 9: 1829
Graphite
(See also Carbon.)
adsorption of hydrocarbons from methanol and ethanol solutions by nonporous, 9: 1790
Graphite (cont'd)
adsorptive properties, at low temperatures, 9: 4399(J)
annealing behavior of neutron-irradiated, 9: 6922
approximate method of evaluating lattice sums of r^{-n} for, 9: 3086(J)
atomic heat between 1 and 20°K, 9: 6923(J)
cosmic shower production in, 9: 2814(J)
crystal structure, rhombohedral modification of, 9: 2654(J)
crystal structure of artificial, layer growth of, 9: 2653(J)
diffusion length and thermal neutron absorption coefficient of, temperature variation of, 9: 6920
dimensional stability, effects of radiation on, 9: 6921
effects of oxide additives on alkali-activated transformation of, by water, 9: 4931
electric conductivity and magnetic susceptibility, 9: 1558(J)
electrical properties, effects of neutron irradiation on, 9: 3328(J)
electrical resistivity, thermoelectric power, and thermal conductivity of proton irradiated, 9: 7389(R)
electronic structure, theory, 9: 1626(J)
energy exchange between, and gas molecules at elevated temperatures, 9: 5908(J)
formation by graphitization of carbons, 9: 5905(R)
formation of spheroidal, 9: 206(J)
gasification with Co_2 at 1454°C, 9: 5904(R)
heat of sublimation, 9: 5907(J)
heat-transfer film coefficient of flowing liquid Sn to, 9: 139
insertion compounds of, 9: 5906(J)
lattice structure, formation temperature, and lattice constants, 9: 7043(J)
lattice vibration specific heat, theory, 9: 3087(J)
low-temperature specific heat, 9: 188(R)
low-temperature thermal and electrical conductivity and thermoelectric power of, 9: 1478
lubricity for high-temperature ball bearings, 9: 1813
mass spectrometric C_3^+ measurements in vapor of, relation to electron-induced water decomposition, 9: 105(J)
metallurgy of, in nuclear energy, 9: 7376(J)
neutron capture cross section, relative accuracy of Swing measurement, 9: 2473
neutron-irradiated, density of electron trapping defects in, 9: 6217(J)
neutron irradiation effects and annealing, 9: 7952(J)
neutron velocity and spectrum, 9: 7892(J)
nucleation and growth of, in steel, 9: 96(J)
oxidation of natural, at 900°C and moisture, volatile matter, and ash determination in, 9: 3088(J)
oxidation rates of, 9: 5283(J)
paramagnetic resonance experiments on, and formation of defects in irradiated, 9: 7389(R)
penetrating showers produced in, 9: 5688(J)
penetration by liquid Ti, 9: 6673(J)
permeability of, to liquid Cu, Hg, and liquid Ag, 9: 4480
physical and chemical properties and use in the construction of chemical apparatus, 9: 3421(J)
physical properties, oxidation resistance, and industrial applications, review, 9: 7305(J)
preparation and use, summary, 9: 4093(J)
properties and reactor applications, 9: 6476
radiation damage, 9: 7155(J)
radiation damage, temperature effect on, 9: 5611(J)
radiation damage to, and annealing behavior of irradiated, 9: 7389(R)
reaction with CO_2 at high temperatures, 9: 6214(J), 6215(J), 6216(J)
reactions with metal borides, equilibria, 9: 5677(J)
resonance energy, 9: 1777(J)
sources, bonding, fabrication, and metallurgical uses, 9: 2303(J)
specific heat of, theory, 9: 4745(J)
specific heat of high-purity Acheson, down to 1.3°K, 9: 3867(R)

Graphite (cont'd)

states of, electronic density, theory, 9: 3788(J)

stored energy release of irradiated, 9: 7389(R)

structure of the π band of, 9: 2192(J)

theory of Hall effect in, 9: 2193(J)

thermal capacity in temperature range 17 to 300°K, 9: 7304(J)

thermal capacity over temperature range below 3°K, 9: 7352(R)

thermal conductivity, effects of neutrons on, 9: 4876

thermal conductivity, temperature dependence of, 9: 2330

thermodynamic functions of, to 12,000°K, 9: 1896

two-dimensional vibration spectrum, 9: 5189

valence bonds of two-dimensional, 9: 2191(J)

Graphite bromides

formation of, 9: 5906(J)

magnetic susceptibility and free energy, 9: 6924(J)

Graphite compounds

(See also headings in the form Graphite bromides and Graphite–potassium compounds.)

paramagnetic resonance absorption in, 9: 1776(J)

Graphite crucibles

preparation and properties of Ti, Zr, V, Nb, Ta, and W, for molten Ti, 9: 2247

Graphite crystals

diffusion of C in, tracer study, 9: 6204

electric conductivity measurement of single, 9: 728(J)

electric properties, effect of electroplating on, 9: 6868

lattice defects of, measured by neutron scattering, 9: 6917(J)

Graphite moderated reactors

description of first Soviet, 9: 7924(J)

research, reference material on, 9: 6479

West German plans for, 9: 2911(J)

Graphite–potassium compounds

formation of, 9: 5906(J)

Graphite–rubidium compounds

formation of, 9: 5906(J)

Graphite–uranium systems

buckling, multiplication factor, and thermal utilization factor, experimental determination, 9: 7925(J)

neutron multiplication, 9: 7888(J)

neutron resonance absorption measurements, 9: 7889(J)

neutron velocity and spectrum, 9: 7892(J)

Greases

(See also Lubricants; Oils.)

development and evaluation of, for −100° to +350°F, 9: 2690(R), 6333(R)

evaporation, lubricity, oxidation, temperature effects, and viscosity, 9: 6333(R)

high-temperature, lubricity, performance, preparation, and properties, 9: 7320

lubrication of high-speed ball bearings with, 9: 4422

lubricity and testing of high temperature, 9: 5310

performance in lubricating open, shielded, and anti-friction bearings, 9: 2790(R), 2791(R)

performance of, in lubricating open, shielded and sealed anti-friction bearings, 9: 6679(R)

silicone, lubricity and performance at high temperature, 9: 1814(R)

synthetic, for aircraft, preparation and properties, 9: 5311

Gt. Brit. Atomic Energy Research Establishment, Harwell, Berks, England

research programs, 9: 5834(J)

Gr. Brit. Culcheth Labs., Culcheth, Lancs, England

progress reports on Li oxidation, 9: 6182(R)

Gt. Brit. Windscale Works, Sellafield, Cumb., England

progress reports on fabrication of plastics, 9: 3760(R)

Great Divide Basin (Wyo.)

stratigraphy and U distribution in, 9: 2263

Green Monster Mine (Nev.)

geology and uranium distribution, 9: 1260(J)

Green Vein Mesa (Utah)

mineralogy, 9: 1829

Greenhouse Operation

relative resistance of commercial windows to blast effects determined during, 9: 6817

Grignard reagents

specific conductance and chemical reactions with lithium borohydrides in $(C_2H_5)_2O$, 9: 6871

Grinding

effects of chemical agents and studies in a vibratory ball mill, 9: 3111(J)

equipment for, of rock samples using alumina ceramic, 9: 3471(J)

Ground

(See also Soils.)

atmospheric β ionization from, 9: 3153

gamma scattering by, Monte Carlo calculation, 9: 1375

scattering of Co^{60} γ radiation by, 9: 6093

Ground waters

alpha radioactivity in, 9: 445(J)

capillary conduction, 9: 236(J)

concentration of radium and thorium in wells of the Chicago and Frankfurt am Main, Germany, areas, 9: 3231(J)

diffusion in soils, 9: 6820(R)

diffusion through soil, tracer study, 9: 2539(R)

Growth

effects of radiation on, of bulbs, 9: 26(J)

effects of x radiation on, of barley, as a test for physiological effects of radiation, 9: 1159(J)

spontaneous and radiation-induced, theory, 9: 6563

Guinea pigs

effects of x radiation at doses between 1,000 and 25,000 r on, 9: 1148(J)

lethal dosage determination of radiation for, 9: 1720

lethal effects of radiation, 9: 2567(J)

metabolism of Te^{132}–I^{132} mixtures in, 9: 3754(J)

spontaneous tumors in, a literature survey, 9: 2545(J)

Gypsum Gap Quadrangle (Colo.)

preliminary geologic map of, 9: 3470(J)

Gypsum products

dissolution of, in water and in acids, effects of turbulent flow and temperature, 9: 3448(J)

Gyromagnetic ratio

measurement of C^{13}, by collapse of spin-spin splitting in $C^{13}H_3I$, 9: 3612(J)

H

Hack's Canyon Mine (Ariz.)
mineralogy, 9: 1829

Hafnium
aqueous and anhydrous chemistry, 9: 6934(R)
chemical polishing, 9: 7990(P)
content and ratio to Zr in minerals and rocks, 9: 1522(J)
determination of microgram amounts of, in iron by x-ray fluorescence analysis, 9: 4382
dissolution of, in acids, 9: 2783(J)
friction testing of halogenated hydrocarbon lubricated, 9: 961(R)
gamma ray yields from Coulomb excitation, 9: 6052(J)
heat capacities, 9: 5077
hyperfine structure of Hf I, isotope shift in, 9: 1138(J)
magnetic susceptibility, 9: 5087(J)
preparation, properties, and industrial uses, review, 9: 7371(J)
production of, by Mg reduction of $HfCl_4$, 9: 4474(J)
spectroscopic determination, 9: 4084(J)
spectroscopic determination in Zr, 9: 3074(J)
x-ray spectrographic determination in Zr minerals and concentrates, 9: 3073(J)

Hafnium chloride addition compounds
with acetonitrile and isoamyl ether, phase studies, 9: 6931
with $POCl_3$, preparation and structure, 9: 5910

Hafnium chlorides
addition compounds with diethyl phthalate, preparation and properties, 9: 72(J)
magnesium reduction of, for production of Hf, 9: 4474(J)
preparation and crystal properties of $HfCl_4$, 9: 6932
solvolysis in CH_3OH and C_2H_5OH, 9: 4967

Hafnium complexes
with alizarin S, polarographic behavior and absorption spectra, 9: 6933

Hafnium compounds
organo-, chemistry, review, 9: 6893(J)
thermodynamic properties of gaseous, 9: 7686(J)

Hafnium isotopes
electromagnetic concentration of, 9: 2837

Hafnium isotopes Hf^{174}
energy levels, spacings and neutron widths of, 9: 6045(J)

Hafnium isotopes Hf^{176}
radiations from, conversion coefficients of γ radiation from, and proposed decay scheme for, 9: 6118(J)

Hafnium isotopes Hf^{177}
energy levels, spacings and neutron widths of, 9: 6045(J)
energy levels from β decay of Lu^{177}, 9: 2058(J)
gamma spectra, 9: 4333

Hafnium isotopes Hf^{178}
energy levels, spacings and neutron widths of, 9: 6045(J)

Hafnium isotopes Hf^{179}
energy levels, spacings and neutron widths of, 9: 6045(J)

Hafnium isotopes Hf^{180}
energy levels, spacings and neutron widths of, 9: 6045(J)

Hafnium oxides
heat and free energy of formation, 9: 529(J)
high-purity, preparation, 9: 868(J)
thermal conductivity, 9: 4779(R)

Hair
fibers of, interaction with aqueous solutions including dye baths, tracer study, 9: 922(J)

Halides
(See also specific halides and halides of specific elements; see also Alkaline earth halides; Alkyl halides.)
detection, film sensitive to halide ions in water aerosols for, 9: 1001(J)
pyrohydrolytic determination of, design of apparatus for, 9: 3411(J)

Halogen fluorides
molecular electric dipole moments, 9: 547
preparation, properties, and uses, 9: 4395

Halogen oxides
heat and free energy of formation, 9: 529(J)

Halogens
absorption of BrF_3 and I_2 vapors in spray columns, 9: 7692
isotopic exchange of ionic, with alkyl halides, isomerization and double bond effects, 9: 6891(J)
leak detector for, arcton concentration in air, calibration of, 9: 6373
thermodynamic properties, 9: 7686(J)

Halohydrocarbons
radiation decomposition of, 9: 102

Hamm Canyon Quadrangle (Colo.)
mineral investigations field studies map of, 9: 4150(J)

Hamsters
lethal dosage determination of radiation for, 9: 1720

Handbooks and manuals
(See also as subheading under specific processes, equipment or sites.)
analytical procedures of interest in industrial hygiene, 9: 6605
on maintenance of radiation detection instruments, 9: 6400
marine waste disposal, 9: 604(J)
on nuclear instrumentation, 9: 5123(J)
on operation, calibration, and maintenance of health physics survey instruments and permissible radiation exposure limits, 9: 6725
on permissible dose from external sources of ionizing radiations, 9: 1453(J)
on photographic dosimetry of x and γ radiation, 9: 2428(J)
on protection against hazards from betatrons and synchrotrons, 9: 4924(J)
on protection against radiations from radium, Co^{60}, and Ca^{137}, 9: 1452(J)
on radiation monitoring, 9: 3928
on radiology, 9: 2542(J)
on rare metals, 9: 2245(J)
on underwater cutting and welding, 9: 6331(J)

Hastelloy
(See Nickel alloys.)

Haynes 25 Alloy
(See Chromium–cobalt–nickel–tungsten alloys.)

Head
effects of irradiation of, of mice, 9: 6836(J)

Health physics
anthology of data, 9: 3746
applications in biological experiments, 9: 5862(J)
manual, on operation, calibration, and maintenance of radiation survey instruments and permissible radiation exposure limits, 9: 6725

Heart
arrhythmias of, induced by intra-cerebral injection of tryptamine-strophanthidin, effect of chlorpromazine on, in dogs, 9: 3005
effects of lipoprotein metabolism and thermal injury on function, 9: 3730(R)
output measurements, using K^{42}, 9: 4364(J)

Heat exchangers
aluminum alloy, application of, in process industries, resistance to corrosion, 9: 950(J)

Heat exchangers (cont'd)
calculation of finside coefficients in longitudinal finned-tube, equations for, 9: 3138(J)
design and construction of a Na-steam superheater test plant, 9: 3443
design and construction of liquid-metal, 9: 3443
design and performance, 9: 4983
design and performance for Hg heat-transfer studies, 9: 1807(R)
design and performance of, for liquid metal systems, 9: 6999(R)
design and performance of, for liquid Na, 9: 1806
design of 100-Kw NaK–Na heat transfer unit, 9: 4179(R)
fabrication of, welding procedures, 9: 632
of graphite, design and performance, 9: 3421(J)
heat and momentum transfer in spined tubes in, 9: 141(J)
heat transfer and effect of voids and Prandtl modulus in tube banks and beds, 9: 2692
heat transfer in cross-flow, equations for penetration of heat or solutes, 9: 140(J)
of liquid metal, performance, 9: 6953
NaK cross-flow, testing, 9: 4175(R), 5657(R)
testing of welds in experimental 14-in., 9: 939
welding of Mo for, 9: 6661
welding of tubular, 9: 216(J)
Heat exchangers (liquid-liquid)
testing of stainless steel and Zr tubes in liquid NaK and Na loops, 9: 1254
Heat flow
(See Convection; Heat transfer; Thermal conductivity.)
Heat of absorption
of nitrogen on finely divided solids, measurement of, 9: 1789(R)
Heat of combustion
vacuum jacket precision calorimeter for measurement of, design and performance, 9: 278(J)
Heat of formation
tables of bond and resonance energies for estimating, 9: 2785
Heat of fusion
and temperature of fusion ratio, relation to atomic number, 9: 3552(J)
Heat of solution
measurement of, microcalorimeter for, 9: 6720(J)
Heat of sublimation
of elemental species at 298°K, 9: 2137
Heat-resisting alloys
(See also specific alloys concerned.)
analysis of, using anion-exchange separations, 9: 1544
with bases of Co alloys and austenitic steel, preparation and properties, 9: 3488(R)
casting and forging for gas turbine application, 9: 3869
chemical and physical properties, 9: 7375(J)
composition, preparation, properties, and testing of ceramic coatings for, in nuclear reactors, 9: 2249(J)
compression-creep properties, 9: 3504(R)
compressive-stress-rupture properties of, 9: 3503(R)
creep, effects of high temperature on, 9: 5358
creep, rupture, and thermal shock tests on castable turbine blades, low in Co and Nb, 9: 1890(J)
effects of B, Ti, W, and Zr additions on mechanical properties of stainless steel, 9: 3502(R)
effects of heat treatment on elevated-temperature tensile properties and microstructure of Ti-base, 9: 2719(R)
effects of rare earth additions on mechanical properties of, 9: 4457
effects of sulfur and phosphorus additions on weld-metal cracking, 9: 4804
Heat-resisting alloys (cont'd)
electron-diffraction analysis of, for identification of minor phases, 9: 5952(R)
hot ductility, device for testing and results, 9: 4197(J)
mechanical properties, effect of C, N, and O on, 9: 7004(R)
metallography, phase studies, and microstructure, 9: 6293
metallurgical testing, 9: 4804
metallurgy and development, 9: 7377(J)
powder-metallurgy of, review, 9: 198(J)
powder metallurgy of X-40, 9: 3173
powder preparation, microstructure, and x-ray-diffraction patterns of Cr_2Ti, $CoTi_2$, and $NiTi_2$, 9: 3841(R)
rupture and tensile properties of wrought and cast Fe- and Co- base, 9: 2720(R)
rupture of, under cyclic temperature conditions, 9: 6662
static, fatigue, and mechanical properties of wrought N-155 alloy at elevated temperatures, 9: 4170
stress, tensile properties, creep, and relaxation of Inconel X-550, S-816, and Waspaloy at elevated temperatures, 9: 7786
tensile properties, creep-rupture at 1350 and 1500°F, and microstructure, 9: 3859
tensile properties, effects of temperature on, 9: 5960
for use in high-temperature strain gages, 9: 7738
x-ray density and oxidation of Cr–Ti alloy, 9: 3841(R)
Heat transfer
(See also Boiling; convection; Heat exchangers; Thermal conductivity; Thermal radiation.)
in air-fluidized particle beds, 9: 6250(J)
analogy between mass transfer and, in turbulent flow, 9: 4132
bibliographies, 9: 6186
in boiler water pipe at high temperatures, 9: 7745(J)
boiling, mechanism, 9: 4129
boiling, wetting effects on, 9: 6246(R)
boiling burnout measurements, 9: 4131
to boiling liquid by free convection from heating surface, 9: 1810(J)
in boiling liquids, 9: 1811(J)
at boiling of various one-component liquids at free convection, 9: 1887(J)
to boiling water forced through a uniformily heated tube, 9: 1804
coefficients, for NaK-56 as heat transfer fluid, 9: 6247
coefficients of, between two annuli carrying flow of liquid metal, 9: 6[illegible]
coefficients of finside, on longitudinal finned-tube exchangers, equation for, 9: 3138(J)
characteristics in compact heat exchangers, 9: 4983
from circular finned cylinders by free convection, 9: 1808
circulation effect on, 9: 3812
coefficient of inclined falling liquid film, effects of angle of inclination and mass flow rate on design data, 9: 3133(J)
computational method of balances, 9: 4985
convective, by radiolytic-gas bubbling in Los Alamos Water Boiler, 9: 4567(J)
in cross-flow heat exchangers and packed beds, equation for penetration of heat or solutes in, 9: 140(J)
design and performance of apparatus for measuring condensing film, 9: 3132(J)
during boiling of liquids in tubes, 9: 7324(J)
during boiling of water in vertical tubes, 9: 4434(J)
effect of voids and Prandtl modulus in tube banks and beds, 9: 2692
effects of agitation on rate of, between air and surfaces in contact with fluidized beds, 9: 2235(J)
electric analogs for solving equations in, 9: 3451(J)

Heat transfer (cont'd)
electrical-geometrical analogs for two-directional problems, 9: 2691
in evaporation of spherical drops of liquid falling through a current of gas, 9: 1015(J)
film coefficient of, for non-Newtonian water suspensions in turbulent flow containing solids of high thermal conductivity, 9: 2236(J)
generalized coefficients, tables, 9: 5622
graphite–liquid Sn system for, at very high temperatures, 9: 139
at high Reynold's numbers, application of generalized integral relation for thermal boundary layer to, 9: 5313(J)
to laminar and turbulent boundary layers, 9: 6951
of liquid metals, review of experimental investigations, 9: 3125
local, by plates in subsonic air flow, 9: 1493(J)
mathematical analysis of, in combined free and forced convection laminar flow of fluids with and without heat sources in channels with linearly varying wall temperatures, 9: 2229
maximum and minimum values of heat transmitted from metal surfaces to boiling water under atmospheric pressure, 9: 3129(J)
maximum flux during boiling transition, 9: 7024
in metal cylinders, mathematical analysis, 9: 5634
natural convection, two and three dimensional effects from flat plates, 9: 4770
operation of a Na heat transfer system, 9: 6953
performance curves, 9: 2697(J)
pressure effects on coefficients of, in boilers, 9: 1242(J), 5312(J)
rates between hot Hg drops and water, spray column measurement, 9: 2099(R)
review, 9: 3137(J)
in semiconductors, theory of, 9: 6810(J)
in SIR, components for, 9: 6999(R)
in SIR, testing of components for, 9: 4175(R), 5657(R)
solutions for complex geometry by electric analogue techniques, 9: 2232(J)
in spined tubes in heat exchangers, 9: 141(J)
in starting area of air-passed slots, 9: 2230(J)
symposium on, 9: 940(J)
theory, 9: 6638
theory and operation of an open thermosyphon for, 9: 6252(J)
by thermal convection in a long cell containing a heat-generating fluid, 9: 4128
theory, 9: 5633
theory, from a boiling fluid, 9: 4773(J)
theory of, at high speeds, bibliography on, 9: 4984
in thermally irradiated samples, analysis, 9: 5314(J)
turbulent flow, in pipes, general law for, 9: 3447(J)
in turbulent flow at smooth walls, mathematical analysis, 9: 3126
in turbulent flow in annulus with various eccentricities, 9: 4433
in vertical tube closed at bottom, measurement, 9: 1805
vibration effect on, in air, 9: 5316(J)

Heaters
design of heating transformer, 9: 931
electric, for carbon combustion apparatus, 9: 1211

Heavy water reactors
(See also Argonne Research Reactor; Homogeneous Reactor Test; JEEP Reactor; NRX Reactor; ZOE Reactor.)
behavior of heavy water in, 9: 6481(J)
conversion ratios and multiplication factors in, 9: 1081(J)
determination of lattice parameters in, 9: 7156(J)
design of, using natural U slugs, 9: 8010(P)
thermal utilization factor in, nomographic determination of, 9: 1086(J)
transfer function of, effect of photoneutrons on, 9: 1084(J)

Helium
adsorption, on TiO_2, 9: 4366
analytical one-electron wave functions in multi-configurational approximation for, 9: 2086(J)
collision of Te^-, Te_2^-, Bi^-, and Sb_2^- with atoms of, 9: 6785(J)
combination with U by chemical cathodic activation and thermal decomposition of He–U complex, 9: 6887(J)
continuous detection and measurement of low concentrations of O_2 by dew-point method, 9: 2636(J)
deuteron scattering, Li^6 energy levels from, 9: 4592(J)
deuteron scattering cross sections from 0.28 to 4.62 Mev, and Li^6 resonance from, 9: 4591(J)
diffusion through base coat glass coatings, 9: 615
diffusion through base coat glasses, 9: 616
elastic scattering of high-energy polarized protons by, 9: 4885
elastic scattering of protons and deuterons by, 9: 410(J)
electron broadening and shift of spectral lines, 9: 5192(J)
electron capture from, by fast protons, 9: 1287(J)
electron detachment from H ions by impact with, 9: 3556(J)
electron loss cross sections for atoms of, passing through gases, 9: 6700(J)
electron scattering, 9: 3696
energy loss of positive ions single scattered in, 9: 1377(J)
excitation of, in fast encounters with H atoms, protons, and positive He ions, 9: 1380(J)
excitation of 2^1S and 2^3S states by electron impact, calculation, 9: 2478(J)
ground state energy, 9: 5751(J)
inelastic scattering of electrons by, 9: 3994
ionization by α particles and fission fragments, 9: 2821
isotopic shifts in spectrum of, calculations of, 9: 6387(J)
photodisintegration, 9: 1363(J)
π^+-photomeson production from, 9: 4859
photoproduction of π^0 mesons in, 9: 7977(J)
pion production cross sections in n-α collisions, 9: 3954
polarization of high-energy protons in elastic scattering on, 9: 789(J)
proton elastic scattering at 0 to 20 Mev by, direction of spin polarization produced by, 9: 5524(J)
proton elastic scattering at 9.76 Mev, 9: 4301(J)
Schrödinger equation for, a more accurate solution of, 9: 1419(J)
second virial coefficients from the exp-six potential, 9: 1908(J)
solubility in liquid N between 78 and 109°K and up to 295 atm., 9: 240(J)
specific ionization of, by high-energy electrons, 9: 3315(J)
stopping of deuterons in, 9: 5803(J)
thermal conductivity and viscosity of, from 0 to 600°C, 9: 2822

Helium (liquid)
gamma transition of, 9: 667(J)
neutron scattering by phonons and rotons in, 9: 6096(J)
specific heat and heat capacity, 9: 3220(J)
supercritical damping of oscillating disks in, 9: 3219(J)
theory, 9: 997(J)
thermomechanical effects in, at 1°K, 9: 665(J), 5081
vapor pressure, at low temperature, corrections, 9: 4481
viscosity, 9: 652(R)

Helium–ammonia systems
mutual solubility of gases at high temperatures in, 9: 3239(J)

Helium–carbon dioxide systems
mutual solubility of gases at high temperatures in, 9: 3239(J)

Helium – carbon dioxide systems (cont'd)
composition of He^3–He^4 mixtures adsorbed on Fe_2O_3, 9: 3897(J)
Helium ion beams (He^3)
bombardment of C targets by high-energy, production of neutrons in, 9: 1993(J)
range-energy and energy-momentum relations, tables, 9: 402
reactions with deuterium in energy range 100 to 800 kev, 9: 2451(J)
Helium ions
charge exchange between neutral atoms and, 9: 7044
charge transfer cross sections for, in rare gases and H_2, 9: 2806(J)
collisions with argon, cross-section for, 9: 5802(J)
electron capture from H atoms by, 9: 1287(J)
inelastic collisions with He atoms, 9: 1380(J)
Lamb shift, 9: 731(R)
scintillation response of anthracene to, 9: 7180(J)
Helium isotopes
compressibility factors of, computation of isotope effect on, 9: 3893
hyperfragment, non-mesonic decay of, 9: 6444(R)
Helium isotopes (liquid)
surface tension of mixtures of, as function of temperature and He^3 concentration, 9: 660(J)
Helium isotopes He^3
acceleration and recovery of, in Cockcroft-Walton accelerator, 9: 7098
circulation system for cyclotrons, design, 9: 7404(J)
deuteron breakup on, 9: 7159(J)
deuteron reactions (d,γ), 9: 1090(J), 7942(J)
deuteron reactions (d,p) at 64 to 954 kev, analysis of data from, 9: 7547(J)
elastic scattering of protons by, 9: 7512(J)
elastic scattering of protons by, angular distribution, 9: 4005(J)
hyperfine structure of He^{3+} and He^3, 9: 4279(J)
melting curves for, 9: 6746(J)
nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)
nuclear susceptibility of liquid and solid, 9: 2350(J)
orthoboric densities of, from 1.3 to 3.2°K, 9: 666(J)
pressure-volume isotherms between 1.5 and 3.8°K, virial coefficients from, 9: 5684(J)
production in high-energy d-d collisions, comparison to H^3 production, 9: 1659(J)
vapor pressure of solutions of, with He^4, 9: 243(J), 5082
viscosity, effects of symmetry on, 9: 5701(J)
Helium isotopes He^3 (liquid)
adsorption of mixtures of liquid He^4 and, on Fe_2O_3, 9: 3897(J)
concentration of He^3 in He^3-He^4 mixtures by superfluid filtration, 9: 663(J)
energy excitation, 9: 5085(J)
energy levels, 9: 3281(J)
heat and entropy of mixing with He^4 on basis of two-fluid theory of He^4, 9: 1561(J)
interpretation of magnetic behavior of, 9: 2351(J)
solution with liquid He^4, specific heat of, 9: 5715(J)
specific heat, temperature dependence of, 9: 5714(J)
specific heat and entropy, 9: 5685(J)
specific heat and heat capacity, 9: 3220(J)
surface tension from 1.08 to 2.32°K, 9: 2342(J)
theoretical treatment of, based on the cell model, 9: 2803(J)
theory, 9: 1560(J)
thermal excitations of, influence of symmetry effects on, 9: 3900(J)
thermodynamic properties of solutions with He^4, 9: 2801(J)
vapor pressure, 9: 1906(J)
Helium isotopes He^4
binding energy, 9: 4273(J)
deuteron breakup on, 9: 7159(J)
elastic scattering of 9.7-Mev protons, 9: 1388(J)
excited states, 9: 6770(J)
melting curves for, 9: 6746(J)
meson (π) photoproduction and (γ,n) reactions, 9: 7079(J)
photodisintegration, 9: 1363(J)
pressure-volume isotherms below 4.2°K, 9: 1907(J)
proton reactions (p,d), (p,2p), and (p,pn), 9: 377
scattering of 14.3-Mev neutrons by, 9: 2941(J)
vapor pressure of solutions of, with He^3, 9: 243(J), 5082
viscosity, effects of symmetry on, 9: 5701(J)
Helium isotopes He^4 (liquid)
adsorption of mixtures of liquid He^3 and, adsorbed on Fe_2O_3, 9: 3897(J)
energy excitation, 9: 5085(J)
heat and entropy of mixing with He^3 on basis of two-fluid theory of He^4, 9: 1561(J)
solution with He^3, specific heat of, 9: 5715(J)
specific heat and heat capacity, 9: 3220(J)
thermal excitations of, influence of symmetry effects on, 9: 3900(J)
thermodynamic properties of solutions with He^3, 9: 2801(J)
vapor pressure, 9: 1906(J)
x-ray diffraction analysis, 9: 1288(J)
x-ray scattering and spatial distributions of atoms in, 9: 648
Helium isotopes He^6
beta emission, maximum energy available, 9: 5206(R)
beta spectrum, 9: 2099(R), 4039(R)
decay and half lives, 9: 1680(J)
electron–neutrino angular correlation coefficient of decay of, 9: 6751(J)
energy levels, 9: 763(J)
excited states, 9: 5154(J)
Gamow-Teller interaction in decay of, 9: 3337(J)
half life, 9: 2951
mass difference of Li^6 and, 9: 763(J)
Hell Creek Formation (S. Dak.)
geology, 9: 7758
Hemangiomas
(See Tumors.)
Hematites
adsorption of dodecylamine acetate and wettability, 9: 1486
Hematology
(See also headings beginning with Blood; see also Erythrocytes; Hematopoietic system; Leukocytes.)
tracer techniques applied to, review, 9: 5587
Hematopoietic system
(See also Blood formation; Bone marrow.)
adenosine triphosphatase and 5-nucleotidase activity and metabolism of, effects of radiation on, in rats, 9: 480(R)
effects of implantation of exogenous tissues from, on radiosensitivity of rats, 9: 480(R)
effects of radiation on, in rats, 9: 2548(R)
effects of radiation on tissue weight, respiration, and enzyme activity, 9: 4665
effects of repetitive exposure to γ radiation on, in rats, 9: 482
effects of small amounts of inhaled radiation on, 9: 6573(J)
effects of total-body x irradiation and of phenylhydrazine on, in rats, 9: 5580(J)

matopoietic system (cont'd)
enzyme systems of, effect of total-body x irradiation on, in rats and mice,
radiation injuries of, protective effects of p-aminopropiophenone, cysteine, and mercaptoethylamine against , in rats, 9: 6580(J)
radiosensitivity and response to colchicine of, in tadpoles, 9: 1448(J)
uptake of Fe by, and effects of radiation on, in young rats, tracer study, 9: 3050(J)
mins
synthesis, effects of irradiation on, in laboratory animals, tracer study, 9: 4914(J)
moglobin
association of Po^{210} with, in blood metabolism, 9: 1708(J)
effects of radiation on solutions of, 9: 6827(J)
of pigs, hemoglobinemia induced by thermal radiation, 9: 5841
nebergh Tunnel Area (Nev.)
exploration and U distribution, 9: 1260(J)
ry Mountains Area (Utah)
exploration, 9: 3466(J)
parin
activation of enzyme systems by, in blood plasma, 9: 2540
storage of, by mast cells, effects of thrombokinase, 9: 1706(J)
ptane
adsorption isotherms of, on lampblack, 9: 6683(J)
mixtures with perfluoroheptane and $TiCl_4$, total pressure from 25 to 80°C, 9: 1751(J)
wear of stainless steel bearings in, 9: 2280
ptane, hexadecafluoro-
mixtures with heptane and 3-methyl heptane, total pressure from 25 to 80°C, 9: 1751(J)
ptane, 3-methyl-
mixtures with perfluoroheptane and tetrachloromethane, total pressure from 25 to 80°C, 9: 1751(J)
ptyl alcohol
adsorption on Cu from aqueous solutions as inferred from H_2 overvoltage measurements, 9: 595(J)
terocyclic compounds
of boron, preparations and reactions of, with di-Grignard prepared from pentamethylene and tetramethylene bromides, 9: 597
synthesis and solubility, 9: 5926(R)
terogeneous boiling reactors
dual-cycle water, performance, 9: 7532(J)
terogeneous reactors
determination of lattice parameters in, 9: 7156(J)
mathematical analysis by reduction to homogeneous reactor equations, 9: 758(J)
nonlinear kinetics of ZOE, 9: 3979(J)
or power, advantages of, 9: 1357(J)
thermal utilization factor, calculation by matrix formalism, 9: 3292(J)
thermal utilization factor in nomographic determination of, 9: 1086(J)
thermal utilization in infinite, effects of coolant or cladding in lattice, 9: 3981(J)
teropoly acids
molecular weight determination of silicotungstic acid, 9: 4072(J)
spectrophotometric determination of P as molybdovanadophosphoric acid, 9: 2635
decane
wear of stainless steel bearings in, 9: 2280
zene, tetradecafluoro-
physical properties, 9: 6209(R)
zenethiols
adsorption of by Ag, contact angle measurements, 9: 3111(R)
Hexogen
detonation velocities of, 9: 3214
High Climb Pegmatite (S. Dak.)
geology, mineralogy and petrology, 9: 3836(J)
High-pressure systems
insulating seal for, 9: 5935(J)
High-temperature alloys
(See Heat-resisting alloys.)
High-temperature corrosion
of austenitic stainless steel and other construction materials in water, 9: 4782
High-temperature oxidation
of synthetic base oils, effects of antioxidants, 9: 4115(R)
Hippuric acid
biosynthesis of C^{14}-labeled, in rats, 9: 486(J)
Hiroshima
atomic bomb injuries among survivors, 9: 3366(J)
effects of atomic explosion on residents, summary, 9: 3745(J)
incidence of leukemia among atomic bomb survivors, 9: 2586(J)
residents of, medical effects of atomic bombs on, statistical analysis, 9: 2535
Histamine
effect on nerve tissue, studied with P^{32}, 9: 7663(J)
levels of, in blood, following exposure to single doses of x radiation, 9: 6570(J)
Hogback Quadrangle (N. Mex.)
preliminary geologic map of, 9: 5328(J)
Holbrook Area (Ariz.)
mineralogy, 9: 1829
Holmium
determination in Zr, 9: 5890(J)
proton fission cross sections at 450 Mev, 9: 7552(J)
spectrographic analysis of, for Y, Dy, and Er, 9: 5272(J)
spectrographic determination of, in Dy and Er, 9: 5272(J)
tissue distribution of, in experimental animals, tracer study, 9: 1725(J)
tissue distribution of, in rats, tracer study, 9: 2551(R)
x-ray absorption spectra (L), 9: 4904(J)
x-ray emission spectrum, 9: 6129(J)
Holmium chlorides
crystal structure, 9: 544(J)
Holmium isotopes Ho^{164}
decay schemes and spectra, 9: 1405(J)
Holmium isotopes Ho^{165}
energy levels, spacings and neutron widths of, 9: 6045(J)
Holmium isotopes Ho^{167}
decay properties, 9: 4634(J)
formation from $Er^{170}(p,\alpha)$ and $Er^{167}(n,p)$ reactions, 9: 4634(J)
Homogeneous boiling reactors
design and cost estimates, 9: 751(J)
research, reference material on, 9: 6479
Homogeneous Reactor Experiment
kinetics, solution of problems with HRE simulator, 9: 371
a pilot-model nuclear power plant, design and cost factors, 9: 5777(J)
Homogeneous Reactor Test
design, 9: 3294(J)
Homogeneous reactors
(See also Fluid fuel reactors; Homogeneous boiling reactors; Homogeneous Reactor Experiment; Homogeneous Reactor Test; Los Alamos Water Boiler; North Carolina Research Reactor; Water boiler neutron sources.)

Homogeneous reactors (cont'd)
development, 9: 6768(J)
power from, cost factors in, 9: 1642(J)
reactivity loss in, prevention, 9: 7533(J)
recombination of H_2 and O_2 from, 9: 754(J)
removal of gaseous fission product poison from, by stripping, 9: 7921
vessels to contain, design and fabrication problems, 9: 5501(J)
Hooker Electrochemical Co., Niagara Falls, N.Y.
progress reports on rubber, plastics and composite materials, 9: 6188(R)
Hope Creek Area (Alaska)
geology and prospecting, 9: 628(J)
Hopi Buttes (Ariz.)
mineral determinations in U deposits and prospects in, 9: 5948(R)
Horizons, Inc., Cleveland
progress reports on determination of coefficients of surface diffusion, 9: 3845(R), 3848(R), 5658(R)
progress reports on research on cladding of base metals, 9: 3477(R)
Hormones
(See also specific hormones, e.g., Corticosterones.)
effects of, on radiosensitivity of somatic cells, 9: 821(J)
effects of, on resorption rate of injected $NaHCO_3$ in rats, tracer study, 9: 3732(J)
growth, effects on radiation injuries in rats, 9: 5864(J)
Horn Drilling Area (Utah)
geology, geophysical exploration, mineralogy and stratigraphy, 9: 1512
Horse Range Mesa Quadrangle (Colo.)
geologic map of, mineralogy, 9: 7775(J)
Hot Springs Dome Area (Alaska)
uranium distribution in, 9: 1523(J)
Howling Coyote Claim (Colo.)
uranium distribution, 9: 1513
Hualapai Indian Reservation (Ariz.)
geophysical exploration of the Ridenour Mine District in, 9: 7334
Hunter Creek Area (Alaska)
uranium distribution in, 9: 1523(J)
Hunt's Mesa (Ariz.)
mineralogy, 9: 1829
Hurricane Operation
fission products from, uptake by plants and animals, 9: 35(J)
Hyaluronic acid
birefringence, 9: 2164
effects of radiation on, 9: 2659(J)
Hyaluronidases
effect of radiation on, 9: 2659(J)
Hyatt Pegmatite (Colo.)
geophysical exploration and geology, 9: 3157(J)
Hyder District (Alaska)
geology, exploration, mineralogy, 9: 6967(J)
Hydra
irradiation injuries of, protective effects of Mg, 9: 41(J)
Hydraulic fluids
corrosive effects, oxidation, thermal decomposition, and properties, 9: 2795(R), 3123(R), 5934(R), 6949(R)
high-temperature, development and properties, 9: 4120(R), 6181(R)
oxidation, corrosive effects and thermal stability, 9: 4484(R)
oxidation and prevention with additives, 9: 4419
properties and corrosive effects, 9: 136(R)
synthetic, for aircraft, preparation and properties, 9: 5311
Hydraulics
(See also Fluids; Pumps; Valves.)
numerical solution of transient hydrodynamic shock problems in 2 space dimensions, 9: 3811
vorticity and deformation in, 9: 1494(J)
Hydrazine, phenyl-
effects of, on hematopoietic system, in normal and irradiated rats, 9: 5580(J)
Hydrides
(See also specific hydrides, e.g., Aluminum hydrides; see also Borohydrides.)
binary, dynamics, 9: 3555(J)
crystal structure and physical properties of metal, 9: 4636(J)
physical properties, 9: 7273
preparation, bibliographies on, 9: 635(R)
properties and reactor applications, 9: 6476
Hydriodic acid
atomic polarizations and dipole moments of, theory, 9: 2888(J)
pure rotational spectra of D-labeled and unlabeled anhydrous, in spectral region between 45 and 170μ, 9: 2217(J)
tritium labeled, microwave spectra, 9: 2097(J)
Hydroaromatic compounds
infrared spectra of mono- and para-disubstituted benzenes, 9: 6626
infrared spectra of monosubstituted benzenes, 9: 6624
isotopic exchange of H atoms in, 9: 7713(J)
lubricity and thermal stability, 9: 4420
polynuclear, physical properties, lubricity, and synthesis, 9: 4108(J)
synthesis and physical and thermal properties of, for use as lubricants, 9: 5626(R)
Hydrobromic acid
atomic polarizations and dipole moments of, theory, 9: 2888(J)
chemical reaction with K, mechanism, 9: 7687(J)
microwave spectra of labeled, 9: 731(R)
pure rotational spectra of D-labeled anhydrous, in spectral region between 45 and 170μ, 9: 2217(J)
tritium labeled, microwave spectra, 9: 2097(J)
tritium labeled, 1 to 2 mm wave spectra, measurements, 9: 4032(J)
x-ray decomposition in rare gas atmospheres, 9: 5914(J)
Hydrocarbon–fluorocarbon systems
theoretical energies of mixing, 9: 4744(J)
thermodynamic properties, 9: 6209(R)
Hydrocarbons
(See also specific compounds and classes of compounds.)
adsorption of, from methanol and ethanol solutions by nonporous carbon, 9: 1790
gas chromatographic elution of gaseous and liquid, from alumina, silica gel or charcoal by CO_2, N_2, or H_2, 9: 2672(J)
isotopic exchange of D between HF and, 9: 3784
radiation decomposition of, 9: 102
radiolysis of, radical production in, 9: 7309(J)
thermal conductivity of viscous, 9: 2336(J)
Hydrochloric acid
activity coefficients of, in $SrCl_2$ solutions, 9: 4071(J)
atomic polarizations and dipole moments of, and D-labeled, theory, 9: 2888(J)
corrosive effects of, on Al, 9: 6326(J)
corrosive effects of, on Cu, kinetics, 9: 2251
corrosive effects of, on copper and steel, 9: 7755

Hydrochloric acid (cont'd)
corrosive effects on Al, effects of heat treatment, iron content, and acid composition, 9: 2706
corrosive effects on Ti, electron diffraction analysis of, 9: 5970(J)
heats of reaction with $SmCl_2$ and $YbCl_2$, 9: 5295(J)
intergranular corrosion of high-purity Al by, grain-boundary segregation of impurity atoms in, 9: 3826
reactions with $EuCl_2$, 9: 5296(J)
synthesis, effect of α radiation on, 9: 7715(R)
tritium labeled, 1 to 2 mm wave spectra, measurements, 9: 4032(J)
vapor-liquid equilibria, 9: 5623

Hydrocyanic acid
nuclear quadrupole interaction in, and D-labeled, in the bending vibrational mode, 9: 2985(J)
quadrupole coupling of deuterons in D-labieled, 9: 2647(J)
vibrational energy of d-labeled, 9: 5897(J)

Hydrodynamics
(See also Hydraulics.)

Hydrofluoric acid
anhydrous, dissociation of fluoborate ion in, 9: 866(J)
boron trifluoride in, conductance and vapor pressure of, 9: 867(J)
corrosive effects on Ti, electron diffraction analysis of, 9: 5970(J)
determination in fuming nitric acid by $AlCl_3$ reagent, 9: 6196
infrared band of molecular complex between CF_3 and HF, 9: 896(J)
infrared spectra of anhydrous liquid, 9: 5925(J)
labeled with deuterium, isotopic exchange of D between hydrocarbons and, 9: 3784
liquid anhydrous, activity of solution components in, 9: 1768(J)
liquid anhydrous, cell for study of infrared spectra of, 9: 1135(J)
preparation by reaction of F with superheated steam at 500°F, 9: 5550(P)
preparation of UF_4 and PuF_4 with anhydrous and aqueous, 9: 1210(J)
rate of solution of Hf-free Zr in solutions of, 9: 3144
specific gravity and volumetric determination of hydrofluoric acid in, 9: 1202(J)
vapor density, 9: 6868
volumetric determination of, in hydrofluoric acid–nitric acid mixtures, 9: 1202(J)

Hydrofluoric acid–bromine fluoride systems
solid-liquid equilibria, electrical conductivities, and vapor pressures, 9: 4741

Hydrofluoric acid–chlorine fluoride systems
solid-liquid equilibria, electrical conductivities, and vapor pressures, 9: 4741

Hydrofluoric acid–iodine fluoride systems
solid-liquid equilibria, electrial conductivities, and vapor pressures, 9: 4741

Hydrofluoric acid–nitric acid systems
determination of HF in, 9: 6196

Hydrofluoric acid–potassium fluoride systems
solid-liquid equilibria, 9: 4741

Hydrofluoric acid–sodium fluoborate systems
phase studies, 9: 2614

Hydrofluoric acid–sodium fluoride systems
phase studies, 9: 2614

Hydrofluoric acid–sulfur dioxide systems
infrared spectra of anhydrous liquid mixtures, 9: 5925(J)

Hydrogen
activated adsorption on pyrolytic nickelous oxide, 9: 65
analysis of ortho and para mixtures of, by thermal conductivity method, 9: 2439(J)

Hydrogen (cont'd)
blistering and embrittlement of pressure vessel steels by, 9: 1887(J)
changes in metallurgical properties of Ti alloys due to presence, 9: 4467(J)
charge transfer cross sections of protons, H ions and He ions in, 9: 2806(J)
collision processes of 14- to 41-kev O ions in, 9: 7566(J)
continuous ion exchange with an endless belt of phosphorylated cotton, 9: 3104(J)
depolarization in metal corrosion, 9: 4143(J)
detection in gases, 9: 4075
determination of, in titanium, 9: 5346
determination of, in Ti and Ti alloys, 9: 3077(J)
deuteron breakup on, 9: 7159(J)
dielectric constants, 9: 4700
diffusion and vacuum extraction determinations in Ti, 9: 981(J)
diffusion in Fe, 9: 2297
diffusion in Fe and ferritic steels, 9: 3191(J)
diffusion in Pd, 9: 969
diffusion in quartz, 9: 5591(J)
diffusion in Zr, 9: 244(J)
diffusion through poisoned Pd, 9: 7839
diffusion through Ni and design of leak for, 9: 1577
divalent, in FHF^- ion, 9: 2185(J)
effect at high pressures on mechanical properties of metals, 9: 5376(J)
effect on mechanical properties of Ti and Ti alloys, 9: 1857, 2749(J)
effects on ductility of SAE 1020 steel, 9: 2285
effects on metals, 9: 1272(J)
elastic scattering of electrons by, perturbation calculation, 9: 1657(J)
elastic scattering of electrons by excited 2s and 2p states of, 9: 1381(J)
electrolytic separation of, from D, effect of nitrate ion and NH_3 on, 9: 1594(J)
electrolytic separation from D, temperature influence, 9: 4739(J)
electron capture from, by He ions, 9: 1287(J)
electron losses in H_2, He, N_2, O_2, Ne, and A, 9: 1067(R)
embrittlement of plated and unplated high-strength steel by, 9: 2297
embrittling effects in Ti and Ti alloys, 9: 3183
gamma reactions (γ,π), 9: 3966(R)
gas chromatographic elution from alumina, silica gel, or charcoal by, 9: 2672(J)
high-frequency gas discharge plasma in, analysis, 9: 4496(J)
hyperfine splitting in ground state of atomic, 9: 454(J)
hyperfine structure, 9: 731(R)
hyperfine structure in acids, 9: 1687(J)
hyperfine structure of, mass corrections to, 9: 3346(J)
inelastic collisions with He atoms, 9: 1380(J)
infrared emission spectra of molecular, between 1.15 and 1.97μ, 9: 2520(J)
interaction with clean metal surfaces, 9: 2159(J)
ion exchange on Dowex 50 at 25°C, 9: 3795(R)
isotope effects in alkaline cleavage of triorganosilanes, 9: 3057(J)
isotopic abundance in meteorites, 9: 6338(J)
isotopic composition of, in carbonaceous meteorites, 9: 1834(J)
isotopic exchange in liquid DBr, and catalysis, 9: 6207(J)
isotopic exchange of, in ketones, aromatic and inorganic compounds, and phosphorus acids, 9: 7713(J)
isotopic reaction rates between CH_3 and, 9: 6918(J)
kinetics of reaction with nitric acid, 9: 3051
liberation on Pt, influence of surface-active substances on the overvoltage of, 9: 5386(J)
low pressure solubility in U, 9: 1797(J)

Hydrogen (cont'd)
mass spectrographic analysis of, for D, 9: 3920
mass spectrographic determination of, in H_2-D_2 mixtures, 9: 4386
melting curves for, 9: 6746(J)
meson reactions (π^- and μ^-), pair production from, 9: 5459(J)
π-meson reaction in, 9: 5448
π-meson total cross sections, 9: 1111(J)
π^--meson elastic scattering at 15 Mev, 9: 5739
π^0-meson photoproduction in H, differential cross sections from 180 to 215 Mev at 135°, 9: 4261(J)
π^0-meson photoproduction total cross sections from threshold to 240 Mev, 9: 4260(J)
microscopic neutron scattering cross sections for, 9: 6029, 6030
molecular collisions in, at lower temperature, 9: 7496(J)
neutron penetration in, 9: 1106
neutron reactions (n,π), 9: 6737(J)
neutron total cross section measurements at high energies, 9: 4004(J)
neutron total cross sections, 9: 1107, 7124
neutron total cross sections at 1.4 Bev, 9: 5486(J)
nuclear magnetic resonance in, 9: 7025(R)
ortho-para, continuous analysis of, 9: 3399(J)
penetrating showers produced in, 9: 5688(J)
photoionization efficiencies and cross sections in, 9: 6747(J)
π^+-photomeson production from, 9: 4859
photon (230- to 450-Mev) cross sections for π^+ meson production, 9: 6015(J)
photon (500 Mev) cross sections for π^+ meson production, 9: 6014(J)
photoproduction of neutral pions in, 9: 3609(J), 3610(J)
photoproduction of π^+ mesons from, near threshold, 9: 4258(J)
positronium formation in, pressure dependence, 9: 4612(J)
pressure-volume-temperature relationships of gaseous normal H from critical temperature to 200 atmospheres pressure, 9: 6369
proton cross sections, 9: 2459
proton total cross sections, 9: 2458
proton total cross sections at 208 and 315 Mev, 9: 358(J)
proton reactions (p,π) at 657 Mev, 9: 6737(J)
purification by Pd barriers, 9: 7841(J)
negative-ion electron photodetachment cross section, 9: 7838(J)
quenching of resonance radiation of K by, 9: 248(J)
radiative capture of high-energy neutrons in, 9: 7517(J)
reaction of H atoms, with other H atoms, contribution of double transitions to cross sections associated with, 9: 2943(J)
reaction with Li between 29 and 250°C, 9: 5589
recombination, from homogeneous reactors, 9: 754(J)
reduction of NiO with, kinetics of, 9: 2617(J)
reduction of silver chloride by, 9: 3765
reduction of silver chlorides by reaction mechanisms, 9: 3763, 3764
reduction of U oxides in H_2O suspension with, 9: 7317
role of, in energy transfer in complex molecules, 9: 3275
scattering cross sections of H^- ions in, 9: 2471
scattering of Po α particles, 9: 1379(J)
slow neutron scattering by ortho and para, 9: 5791(J)
solid, molecular properties, 9: 3617(J)
solidified, compressibilities at low temperature, 9: 2824(J)
solubility and decomposition pressures of, in α Zr, 9: 1877(J)
solubility in liquid N_2, estimation, 9: 5896(J)
solubility of, in liquid methane at temperatures from 90.3 to 127.0°K and at pressures from 180 to 230 atm., 9: 241(J)

Hydrogen (cont'd)
solubility of, in liquid N at 79 to 109°K and pressures to 190 atm., 9: 239(J)
solubility of, in Ti and Ti alloys, 9: 1857
solubility of, in water, enrichment of D_2 in, 9: 2405
specific heat, thermal conductivity, and viscosity of, from 0 to 600°C, 9: 2822
specific ionization of, by high-energy electrons, 9: 3315(J)
Stark effect broadening of high Balmer lines, 9: 450(J)
stopping of deuterons and protons in, 9: 5803(J)
thermodynamic data at very high temperatures and pressures, 9: 4822(J)
thermodynamic functions of, to 12,000°K, 9: 1896
thermodynamic properties, effect of dissociation on, 9: 7840
transition complex H_3Cl, semiempirical study through H isotope effects, 9: 6894(J)
2s-2p transitions, cross sections for, 9: 5794(J)
triatomic complex, molecular structure, quantum mechanical approach, 9: 5718
ultraviolet emission by α bombardment, 9: 3241(J), 5405(J)
virial coefficients, 9: 6369
viscosity of, relation to para-ortho concentration, 9: 7496(J)
yield from decomposition of methanol by Co^{60} gamma radiation and 28-Mev He ions, 9: 2202(J)

Hydrogen (liquid)
flexible transfer tube, design, 9: 3089
production, maintenance manual for portable liquefaction plant for, 9: 4119
production, operation manual for portable liquefaction plant for, 9: 4118
styrofoam containers for, used in nuclear experiments, 9: 5683(J)
styrofoam containers for targets of, having a liquid N heat shield, design, 9: 654

Hydrogen–deuterium systems
mass spectrographic determination of H_2, HD, and D_2 in, 9: 4386
radiation-induced and catalytic-induced equilibrium constants, 9: 4090(J)

Hydrogen fluoride ions
(See Acid fluoride ions.)

Hydrogen ions
absorption by Ti, 9: 7824
charge equilibrium ratios for, from protons incident on solids, 9: 2481(J)
charge exchange between neutral atoms and, 9: 7044
charge transfer cross sections for, in rare gases and H_2, 9: 2806(J)
dissociation of molecular, in mass spectrometer, 9: 5417(J)
electron detachment from, by impact with He, 9: 3556(J)
electron emission from Mg, Al, Fe, Ni, Au, and Pb, bombarded by H_1^+ and H_2^+, 9: 250(J)
electron photodetachment cross sections of, 9: 5699(J)
mass ratio determinations by cyclotron resonance in omegatron, 9: 5166
negative, production and scattering in H, 9: 2471
negative atomic, charge transfer to protons, 9: 3672(J)
production of negative, by 11.5- to 28-kev protons traversing metal foils, 9: 6789(J)
sources, measurement of variables, 9: 2388(J)

Hydrogen isotopes
compressibility factors of, computation of isotope effect on, 9: 3892
electrolytic separation factor of, at Hg cathode, 9: 71(J)
electrolytic separation of, 9: 1435(P)
enrichment of H_2 in D_2 during H_2 dissolution in water, 9: 2405
gas phase measurement of β particles from, 9: 2180(J)

Hydrogen isotopes H^4
mesonic decay, 9: 7090(J)
search for, in carbon fission by 300 Mev protons, 9: 6079(J), 6769(J)
Hydrogen–methane systems
phase studies, 9: 241(J)
Hydrogen moderated reactors
(See also Homogeneous reactors; Water moderated reactors.)
experimental study at Academy of Sciences of USSR, 9: 7927(J)
Hydrogen–nitrogen systems
phase studies, 9: 239(J)
Hydrogen–nitrogen–titanium systems
preparation and constitution diagrams, 9: 4187
Hydrogen–oxygen systems
chemical interactions, effect of C_3H_8 on, 9: 7274
effect of burner tip temperature on flash-back of flames of, 9: 4706
Hydrogen–oxygen–water systems
chemical reactions in corrosion loops, kinetics, 9: 6477
Hydrogen peroxide–water systems
thermochemical properties, at 0° and 27°C, 9: 4394(J)
Hydrogen peroxides
analytical procedures for, stabilization, and industrial uses, 9: 521
bibliographies, 9: 520, 521
catalytic decomposition in presence of O_2, 9: 2130
chemical properties and decomposition, bibliography on, 9: 3383
determination, 9: 2657(R)
effects of, on radiation injuries in Paramecium, 9: 4672(J)
formation from visible light irradiation of H_2O, 9: 6611(J)
formation of, by α irradiation of aqueous solutions, inhibitory effects of Cl^-, 9: 581(J)
formation of, from radioinduced decomposition of water, effects of KCl and KBr on, 9: 2660(J)
infrared absorption spectra of natural and D-labeled
kinetics of oxidation of selenious acid by, 9: 851
oxidation of selenious acid by, kinetics, 9: 4715(J)
physical properties and structure, 9: 520
removal from ethers by cerous hydroxide, 9: 4752(J)
solid γ-irradiated, paramagnetic spectra, 9: 3423(J)
thermochemical properties of liquid, at 25°C, 9: 4394(J)
Hydrogen peroxides-d_2
solid γ-irradiated, paramagnetic spectra, 9: 3423(J)
thermochemical properties of liquid, at 25°C, 9: 4394(J)
Hydrogen peroxide-d_2–water-d_2 systems
thermochemical properties, at 0° and 27°C, 9: 4394(J)
Hydrogen–plutonium systems
phase studies, 9: 5930(J)
Hydrogen–sodium systems
dissociation pressures of H in Na–NaH–H systems at 500° to 600°C, 9: 3774(J)
Hydrogen sulfide–water systems
effects of, on electrode potentials and corrosion of Zn, Fe, Al, Ag, Pb, Sn, Ni, Cu, Mg, Avial, steel, and brass, 9: 4143(J)
Hydrogen sulfides
absorption band at 4,900 cm^{-1} of D-labeled, 9: 1136(J)
d- and t-labeled, thermodynamic functions, 9: 5700
effects of gaseous and liquid, on corrosion of Mg, Pb, Al, Fe, Zn, Ag, Ni, Cu, Avial, brass, and steel, 9: 4143(J)
radiation protection, 9: 2599(J)
Hydrogen–titanium systems
microstructure, 9: 1857
Hydrogen–titanium systems (cont'd)
tensile properties in the temperature range -196 to 515°C, and preparation, 9: 5667
Hydrogen tritides
formation and relative abundance in atmosphere, 9: 126(J)
Hydrogen–tritium systems
preparation of standard samples for mass spectrographic analysis, 9: 3248
Hydrolysis
of metal ions, study of, 9: 1469(J)
Hydroquinone
reduction of Fe^{3+} by, in presence of 1,10-phenanthroline, 9: 5596(J)
Hydroxyl radical
electronic energy of, 9: 6546(R)
microwave spectra, 9: 6437(R)
Hygrometers
microwave, design, 9: 7057
Hyperfine structure
anomaly in p-states of gallium, 9: 7136(J)
in nuclear resonance line shape, effect of chemical shift and J coupling on, 9: 1636(J)
theory, 9: 2523(J)
Hyperons
beta decay, 9: 6740(J)
binding energies of nuclei containing bound, 9: 7518(J)
cloud chamber investigations and summary of properties, 9: 4858
decay, 9: 5455(J)
decay schemes and lifetime, 9: 5132(J)
detection by electronic means, 9: 7477(J)
disintegration of nuclei containing, 9: 7476(J)
as excited states of nucleons, 9: 5451(J)
Gell-Mann theory of existence and interaction, 9: 6136(J)
masses of, by optical photometry, 9: 7490(J)
mathematical formulation of Gell-Mann model for, 9: 7202
mean life and decay theory, 9: 5135(J)
nuclear capture of, characteristics of interactions produced by, 9: 6426(J)
production in π^-–p collisions at 1 Bev, 9: 5461(J)
production of, 9: 5741(J)
stability of, in interaction with nuclear fragments, 9: 7106
stable, existence in cosmic radiation, 9: 5090(J)
theory of Λ° particles, 9: 7482(J)
Hypo
(See Los Alamos Water Boiler.)
Hypophysis
(See Pituitary gland.)
Hypoxia
(See Anoxia.)
Hypsometers
development of, using carbon dioxide in pressure-altitude measurements in the upper air, 9: 6707

I

Ianthinites
alteration product of, from Katanga region (Belgian Congo), 9: 959(J)
Ice
fluorescence and thermoluminescence effects of radiation on, 9: 6868
gamma-irradiated, paramagnetic spectra, 9: 3423(J)
molecular structure, 9: 6610(J)

Ice (cont'd)
x-ray excited fluorescence and thermoluminescence of pure and impure, 9: 3095(J)
Ice-d_2
gamma-irradiated, paramagnetic spectra, 9: 3423(J)
Idaho (Cassia Co.)
radioactive carbonaceous shale and lignite deposits in Goose Creek District in, 9: 2263
Idaho (Clark Co.)
uranium and Th deposits in Birch Creek District in, 9: 1520(J)
Idaho (Jefferson Co.)
uranium and Th deposits, 9: 1520(J)
Idaho (Lemhi Co.)
uranium and Th deposits in Blackbird and Lemhi Pass Districts in, 9: 1520(J)
Idaho (Scott Co.)
uranium and Th deposits in, 9: 1520(J)
Igneous deposits
occurrence in southwestern Ark., 9: 7333
secondary concentrations, 9: 7759
Igneous deposits (Ariz.)
occurrence in Ruby quadrangle, 9: 161
Igneous deposits (Nev.)
occurrence in northern Nev., 9: 6963
Igneous deposits (U.S.)
occurrence of U bearing, 9: 5326(R)
Igneous rocks
spectrophotometric determination of Th in, 9: 4945
Illinois
radioactivity of coal and shale deposits of southern, 9: 6653
Illinois Inst. of Tech., Chicago
progress reports on investigation of imperfections in solids, 9: 3890(R)
progress report on the thermodynamics of the liquid solution in the Cu–Ag system, 9: 5357(R)
Illinois Inst. of Tech., Chicago. Armour Research Foundation
progress reports on detection of air-borne Be dust, 9: 5076, 5720(R)
progress reports on development of Ti-base alloys of high strength and toughness, 9: 1534(R), 5964(R)
progress reports on effects of alloying elements on weldability Ti and Ti alloys, 9: 3854(R), 3493(R)
progress reports on evaluation of high-strength weldable Ti-base alloys, 9: 3499(R)
progress reports on exploration of vanadium-base alloys, 9: 3516(R), 3517(R), 3853(R)
progress reports on Laves-type intermediate phases, 9: 2721(R)
progress reports on increasing ratio of modulus of elasticity to density of Ti alloys, 9: 2293(R), 2728(R)
progress reports on mechanisms of heat treatment of Zr-base alloy, 9: 1530(R)
progress reports on metallurgical characteristics of Al–Ti-base alloy, 9: 3475, 3849(R)
progress reports on phase relationships and transformation processes of Ti alloys, 9: 180(R), 1841(R), 1842(R), 1843(R), 1844(R), 3484(R)
progress reports on radiation sensitive glasses, 9: 2945(R)
progress reports on solid solution hardening of alpha and beta Ti, 9: 6997(R)
progress reports on structural changes of Ti alloys, 9: 3486(R)
progress reports on surface hardening of Ti with metalloid elements, 9: 978(R), 7787(R)
progress reports on titanium alloys for elevated temperature application, 9: 1845(R), 1850(R), 2719(R), 5343(R), 7004(R), 7357(R)
Illinois Inst. of Tech., Chicago. Armour Research Foundation (cont'd)
progress reports on weldability of titanium sheet, 9: 4789(R)
Illinois. Univ., Urbana
progress reports, 9: 5348(R)
progress reports on effects of high-energy radiation on chemical systems, 9: 2657 (R)
progress reports on high-temperature-resistant ceramic coatings and ceramic and metal–ceramic bodies, 9: 4137(R), 4139(R)
Illinois. Univ., Urbana. Electrical Engineering Research Lab.
progress reports on conducting thin films, 9: 3175(R)
progress reports on research and investigation leading to methods of generating and detecting radiation in the 100 to 1000μ range of the spectrum, 9: 2885(R), 2886(R)
Illium R Alloy
(See Nickel alloys.)
Immunity
to tetanus toxoid, effects of x irradiation on, in mice, 9: 4668
Impact shock
equipment for tensile and Charpy V-notch tests, design and performance of, 9: 2296
from explosions, mechanical response of different parts of a living rabbit body, 9: 6564(J)
mathematical analysis of, in materials with two solids in contact, 9: 5932
measurement, design of a barium-titanate accelerometer for, 9: 624
numerical solution of transient hydrodynamic shock problems in 2 space dimensions, 9: 3811
testing equipment for cermets, 9: 4140
Incompressible flow
(See also Compressible flow.)
density gradient in, effect on Taylor instability, 9: 3446
stability conditions for spherically symmetrical, 9: 3442
two-dimensional, laminar viscous mixing of jets in, theoretical analysis, 9: 4130
Inconel
(See Nickel alloys.)
Indexes
subject headings used in catalogs of the AEC, 9: 2100
India
gadolinium minerals distribution in, 9: 7335
Indiana
exploration of coal field in, 9: 1515
Indiana Coal Field
exploration, U distribution, and geology, 9: 1515
Indium
diffusion of, in single crystals of Ag, tracer study, 9: 668(J)
electroforming from fluoborate and sulfate baths, 9: 3495
excitation by protons, energy levels study by means of, 9: 5476(J)
neutron resonances from total cross section measurements, 9: 5394
neutron total cross sections, 9: 5423
photon scattering cross section, 9: 4205(R)
quantitative determination, 9: 4727(J)
radiochemical determination, 9: 876
slow neutron cross sections, 9: 1391(J)
slow-neutron resonances, radiation width variations in, 9: 5477(J)
spectrographic determination of, in ores and rocks, 9: 162
use in gaskets and valves for high vacuum systems, 9: 5407
Indium (liquid)
solubility of Be in, 9: 5954
Indium–aluminum–titanium alloys
hardness, crystal structure, and phase studies, 9: 3520

Indium antimonides
magnetic susceptibility, 9: 5382(R)

Indium–beryllium alloys
constitution diagrams, 9: 5954

Indium bromides
chemical stability of, 9: 2157(J)

Indium chlorides
chemical stability of, 9: 2157(J)
crystal structure, 9: 544(J)

Indium complexes
formation in In–Br systems, 9: 2331(R), 4205(R)

Indium fluorides
chemical stability of, 9: 2157(J)

Indium foils
beta self-scattering, self-absorption, and backscattering from, effect of thickness on, 9: 7855
effect of orientation on neutron induced activity, 9: 2857(J)

Indium iodides
chemical stability of, 9: 2157(J)
crystal structure, 9: 6911
microwave spectra, 9: 6437(R)
preparation and crystal structure, 9: 2136(R)

Indium isotopes
electromagnetic concentration of stable, yields and equipment, 9: 2406
Szilard-Chalmers concentration, 9: 1959(J)

Indium isotopes In^{107}
gamma radiations, investigation with scintillation spectrometer, 9: 7104
gamma spectra from deuteron bombardment, 9: 734

Indium isotopes In^{113}
energy levels, spacings and neutron widths of, 9: 6045(J)
internal conversion coefficients for isomeric transitions of, measurement of, 9: 6529(J)
isomeric transition, 9: 2953(J)

Indium isotopes In^{114}
gamma spectra of, 9: 435(J)

Indium isotopes In^{115}
angular momentum of 1,458-ev neutron resonance, 9: 5489(J)
"brute-force" polarization in, 9: 5489(J)
energy levels, 9: 1347(J), 3335(J)
energy levels, spacings and neutron widths of, 9: 6045(J)
internal conversion coefficients for isomeric transitions of, measurement of, 9: 6529(J)
isomeric transition, 9: 2953(J)

Indium isotopes In^{117}
decay schemes, 9: 2056(J)

Indium-nickel alloys
surface tension and wettability, 9: 653(R), 7752(R)

Indium oxides
heat and free energy of formation, 9: 529(J)

Indium–thallium alloys
diffusionless phase transformation, crystal structure, heat treatment, and effects of tensile and compressive stresses, 9: 1661(R)
thermal conductivity of, at low temperature, 9: 3202(J)

Induced radioactivity
(See also appropriate subheadings under specific materials.)
in sea water, by slow neutrons, 9: 6103(J)

Induction furnaces
(See also Furnaces; Heaters.)

Induction furnaces (cont'd)
choice and construction of monolithic linings for twin-bath, for melting Al alloys, 9: 3195(J)
design, 9: 5654(R)
design of high-frequency, for determining C^{14}, 9: 1476

Industrial Atomic Energy Conferences
minutes of 3rd, 9: 6147(J)

Industrial hygiene
analytical procedures, 9: 6005

Industrial management
quality control from field failure reports, 9: 1

Infections
(See also specific bacteria, diseases, organs, etc.)
with E.coli, susceptibility of mice, effects of spleen shielding during irradiation on, 9: 5581(J)
radioinduced, 9: 2578(J)
radioinduced activation of latent Bartonella muris, in rats, 9: 1164(J)

Influenza virus
effects of x radiation on infectivity and hemagglutination properties, 9: 2106

Infrared gas analyzers
for determining isotope ratios, design, 9: 5713(J)

Infrared radiation
(See also Thermal radiation.)
detection and measurement of, design and performance of apparatus for, 9: 3759(R)
effects of exposure to, on chromosomes in Drosophila, 9: 3021(J), 3023(J)
effects on doubly activated ZnS phosphors, 9: 431(J)
fluorescence caused by, 9: 7494(R)

Infrared spectra
of cyclopentadienyl-carbon monoxide compounds of V, Mn, Fe, Co, Mo, and W, 9: 6936(J)
equipment for measurement of, 9: 7327(R)
of gaseous organic compounds adsorbed on microporous glass, 9: 7732(J)

Infrared spectroscopy
applications to study of polymers, literature survey, 9: 3115

Insects
effects of γ radiation on, 9: 6507(R)

Instruments
(Common instruments are entered directly, e.g., Pressure gages; see also Electronic equipment; Meteorological instruments.)
analysis of data recording systems, 9: 7846(J)
automatic oscillograph readers, 9: 7845(J)
design and errors, 9: 2836(J)
design for time derivative of acceleration measurements for ballistocardiography, 9: 5703
development of an air mass-flow rate meter, 9: 7431
for handling of nuclear data, 9: 5993(J)
for measurement of currents associated with corrosion, 9: 6265(J)
nuclear fire detector, 9: 2832(J)
process, survey of, 9: 7449
recording integrating photoelectric and radioactive scanner, 9: 2393(J)
timing, use of glow tube scaler in, 9: 5723
x-ray-diffraction chamber for study of liquids at temperatures up to 1600°C, 9: 7435

Insulators
(See also Electric insulators; Thermal insulation.)

Interferometers
(See also Optical systems; Spectrometers.)

Interferometers (cont'd)
electron, design of, 9: 1023(J)
electron, with three-crystal diffraction, theory, 9: 1024(J)
Rayleigh type, design, construction, and calibration, 9: 546
use of photoelectric cells in, 9: 6130(J)

Intermetallic compounds
(See also specific intermetallic compounds, which are indexed with components both in alphabetical and reverse orders; see also Alloys.)
corrosion, physical properties, testing and preparation, 9: 2740
intermediate phase studies and melting temperatures of Laves-type, 9: 2721(R)
intermediate phase studies and valence calculations of transition metals of Laves-type, 9: 2736
preparation and structures of Nb_3Sn, Nb_3Os, Nb_3Ir, Nb_3Pt, Ta_3Sn, and V_3Sn, 9: 3878(J)

Intermolecular forces
molecular distribution functions in systems with Coulomb forces, 9: 7583(J)

Internal conversion
(See also appropriate subheadings under specific elements and isotopes, under Electrons, and under Gamma radiation; see also Conversion electrons.)
coefficients for isomeric transitions of Sr^{87*}, In^{113*}, and In^{115*}, measurement of, 9: 6529(J)
coefficients for K shell, threshold values, 9: 5482(J)
coefficients of, comparison of experimental and theoretical values of, 9: 6461(J)
coefficients of, for L shell, discussion of, 9: 6460(J)
coefficient of, in AcX^* 50 kev γ, 9: 6109(J)
in L and M subshells, 9: 4552(J)
natural width of conversion lines, relation to width of x-ray absorption discontinuities, 9: 6463(J)
of radium B, measurement of widths of lines of, 9: 6464(J)

Internal defects
(See appropriate subheadings under specific materials.)

Intestine
(See also Gastrointestinal tract.)
bacteria of, effects of total-body irradiation on, in rats, 9: 6161(J)
effects of thermal neutrons compared with effects of x radiation on, in rats, 9: 1711
effects of total-body irradiation on, in mice, 9: 5229(J)
indigenous flora of, relationship to radioinduced bacteremia in rats, 9: 2115(J)
lesions of, following exposure to total-body irradiation, effects on bacterial infection in mice

Inulin
biosyntheses of C^{14}-labeled, 9: 3(R)

Invar
(See Iron-nickel alloys.)

Iodide ions
adsorption of, on AgI in presence and absence of lauric acid, 9: 623(R) 3111(R)
transfer through mucosa of normal and artificially constructed bladders, tracer study, 9: 1732(J)

Iodides
mechanism of renal clearance of, tracer study, 9: 5878(J)

Iodine
adsorption on graphite, 9: 5906(J)
chemical effects of (d,p), (n,2n), and (γ,n) activation of, 9: 1782(J)
determination and separation by an ion exchange method, 9: 6900
distribution in rabbit brain and metabolism in humans, tracer studies, 9: 2099(R)

Iodine (cont'd)
effects of, on uptake of I^{131} by thyroid gland in rats, 9: 508(J)
effects of thyroxine and KSCN on accumulation of, by thyroid gland, 9: 1709(J)
energy levels study by means of electric excitation by protons, 9: 5476(J)
distribution in tissues and milk in dairy cows, tracer study, 9: 1150(J)
metabolism by thyroid gland, effect of thyrotropin on, in rats, tracer study, 9: 4690
metabolism by thyroid gland, effects of dietary fluorine, tracer study, 9: 2610(J)
molecular excited, exchange of vibrational and translational energy between, and rare gases, 9: 3571(J)
nuclear quadrupole coupling, 9: 1340(J)
solubility of, in a perfluoroamine and perfluoroether, 9: 95(J)
thyroidal clearance, tracer study, 9: 2603(J)
tissue distribution of various dosages of, in rats, tracer study, 9: 597(J)
uptake by human fetal thyroids, tracer study, 9: 4694(J)
uptake by plants, effects of pH, plant species, and I concentration, tracer study, 9: 6174

Iodine complexes
formation, 9: 4101(R)

Iodine fluoride–hydrofluoric acid systems
solid-liquid equilibria, electrical conductivities, and vapor pressures, 9: 4741

Iodine fluorides
magnetic susceptibilities, 9: 4741

Iodine ions
adsorption on AgI at pH 7.5 and 9, 9: 4980

Iodine isotopes
fission product, importance in absorption by plants, 9: 5837
nuclear properties, 9: 735
yield from 14-Mev neutron fission of U^{238}, 9: 7222(J)

Iodine isotopes I^{128}
beta and gamma radiations and electron capture process, 9: 5475(J)

Iodine isotopes I^{127}
nuclear quadrupole resonances in BiI_3 and SbI_3, 9: 5472(J)
spectrophotometric determination of, in the presence of At^{211} and I^{131} in excised thyroid tissue, 9: 1477

Iodine isotopes I^{131}
autoradiographic demonstration of tissue distribution of protein-bound, in thyroid gland of mice, 9: 1178(J)
blood plasma levels of injected, in determinations of radiation injury in rats, 9: 6824
clearance of, correlation with renal function, in hyperthyroidism and myxedema, 9: 1180(J)
conversion electron spectrum, 9: 4864
cumulative yields from neutron fission of U^{235}, 9: 4653
destructive effects of, on thyroid tissue of rats, 9: 5855(J)
diagnostic and therapeutic use in thyroid carcinoma, a review of 48 patients, 9: 5241(J)
distribution of, in thyroid and blood serum components following administration of therapeutic doses, 9: 1460(J)
early tissue distribution and renal excretion patterns, as a diagnostic aid, 9: 1463(J), 1464(J)
effects of ingested, on thyroid gland of salmon parr, 9: 828(J)
effects of radiation from, on functioning of thyroid gland in rats, 9: 5574(J)
evaluation of gland depth error in measuring thyroid uptake of, 9: 4681(J)
fission recoil of, from U oxide particles into KIO_3, chemical effects, 9: 3422(J)
histological changes in thyroid gland due to, identification, 9: 7244(J)

Iodine isotopes I^{131} (cont'd)

histopathological effects of large doses of, on thyroid gland of dogs, 9: 1169(J)

improved techniques for use in thyroid-uptake studies, 9: 1737(J)

isodose measurements of γ radiation from, made over entire body, 9: 2605(J)

late effects of treatment on patients, 9: 1723(R)

localization in thyroid tissue, counting method, 9: 46(J)

localization of internally deposited, performance of collimators and scanning device for use with scintillation detector, 9: 6421(J)

monitoring for, in stack effluent, instrument design, 9: 7854

pathological effects of, in rats, 9: 4039(R)

radiation from, histologic effects on thyroid gland of rats, effects of hypophysectomy and of thyroxine on, 9: 2113(J)

radiometric determination of, in the presence of At^{211} and I^{127} in excised thyroid tissue, 9: 1477

radiometric determination of, in thyroid glands of cattle, 9: 7249(R)

renal clearance of, in studies of mechanism of iodide excretion, 9: 5878(J)

separation from irradiated tellurium dioxide, 9: 3796

spectrographic determination in radioactive solutions, 9: 6898

therapeutic effects of, in treatment of hyperthyroidism and thyrotoxic myopathy, 9: 3749(J)

therapeutic uses, radiation sickness in man following, 9: 5854(J)

therapeutic uses of, calculation of blood radiation dose, 9: 1173(J)

thyroid deficiency following uptake of, effects on bone growth in mice, 9: 485(J)

thyroid uptake of tracer and therapeutic doses of, comparison, 9: 45(J)

thyroidal uptake of, in diagnosis of thyroid diseases, 9: 5877(J)

tissue distribution in anesthetized and stimulated rabbit, 9: 2544(J)

tissue distribution of, in muscle and malignant melanoma tissue, 9: 3028(J)

toxicity of, in rats and monkeys, 9: 5571

in treatment of hyperthyroidism, 9: 6155(R)

uptake by thyroid carcinomas, evaluation, 9: 4685(J)

uptake by thyroid gland, diagnostic applications, 9: 3047

uptake by thyroid gland, effects of administration of desiccated thyroid on, 9: 507(J)

uptake by thyroid gland, effects of liver diseases on, 9: 499(J)

uptake by thyroid gland, effects of phenothiazine and of free iodide on, in rats, 9: 508(J)

uptake by thyroid gland in dogs, effect of diet, hypophysectomy, and TSH on, tracer study, 9: 6175(J)

uptake by thyroid gland of hypophysectomized rats, effect of direct and explant-transplants of anterior pituitary, 9: 1733(J)

Iodine isotopes I^{132}

cumulative yields from neutron fission of U^{235}, 9: 4653

design and handling of a radiation source containing, 9: 7984(P)

half life, 9: 7222(J)

metabolism of mixtures of Te^{132} and, in rats and guinea pigs, 9: 3754(J)

production of, equipment modifications, 9: 2099(R)

thyroid uptake of, in diagnosis of thyroid diseases, tracer study, 9: 1179(J)

Iodine isotopes I^{133}

cumulative yields from neutron fission of U^{235}, 9: 4653

half life, 9: 7222(J)

Iodine isotopes I^{134}

cumulative yields from neutron fission of U^{235}, 9: 4653

Iodine isotopes I^{135}

cumulative yields from neutron fission of U^{235}, 9: 4653

half life, 9: 7222(J)

Ion beams

(See also specific particle beams, e.g., Proton beams; Helium ion beams (He^3); see also appropriate subheadings under Accelerators and specific accelerators.)

application of intense, for excitation of gases, design and performance of apparatus for, 9: 2477(J)

charge states of, passing through gases, 9: 992(J)

desorption of positive, by electrostatic fields, 9: 988(R)

dissociation of negative molecular ions in gases, 9: 2933(J)

dynamic pressure stage elements for projection of intense monokinetic, into gases at high pressure, design and performance of equipment, 9: 2475(J)

energy spectrum of canal-ray ions, calculation and measurement, 9: 4213(J)

mathematical analysis in linear accelerators, 9: 397(J)

measurement of gas density with, 9: 1940(J)

negative, production and measurement of scattering, apparatus for, 9: 2471

space charge effects, review, 9: 6780(J)

space charge neutralization of, in calutrons, device for, 9: 7997(P)

splitting in magnetic field, 9: 6337

Ion exchange

(See also Adsorption; Waste processing.)

and adsorption in metal-metal ion systems, review, 9: 121(J)

continuous countercurrent methods and equipment for, 9: 6230(J)

elution behavior of alkaline earth and alkali ions on sulfonic acid resins, 9: 5298(J)

generalized coefficients, tables, 9: 5622

gradient elution theory in, 9: 4410(J)

infrared absorption determination of weak acid equilibrium constants, 9: 7729(J)

from lithium chloride solutions, 9: 3103(J)

review, 9: 3106(J)

review of new developments in, 9: 68(J)

simultaneous surface exchange using both cation and anion, 9: 4370(J)

symposium, 9: 4968(J)

techniques, general review, 9: 5862(J)

theory, 9: 3769(J)

theory, a review of recent problems, 9: 7730

Ion exchange materials

(See also Anion exchange materials; Cation exchange materials.)

adsorption of metals by anion-type, 9: 2331(R)

behavior of, in liquid ammonia, 9: 515

cloth, testing, 9: 6228(R)

effectiveness of, in removal of amine, ammonia-type organic arsenates, and phosphate-type chemical warfare agents from water supplies, 9: 914

efficiency, 9: 6230(J)

osmotic behavior, 9: 3099(J)

preparation, moisture content, capacity, yield strength, thickness, and potential measurements of membranes of polystyrenesulfonic acid type, 9: 1753(J)

swelling of resins in mixtures of water and methanol, ethanol, isopropyl alcohol, and dioxane, 9: 1750(J)

titration, capacity, and swelling of methacrylic acid resins, 9: 7311(J)

Ion exchange processes

(See also Ion exchange processes.)

for separation of alkali metals in EDTA solutions, 9: 2214(J)

thermodynamic theory of, 9: 116

Ion exchangers

capacity and leakage of ion exchange columns, 9: 1482(J)

design and performance, 9: 910(J)

Ion exchangers (cont'd)
design and performance of, using phosphorylated cotton, 9: 3104(J)
effect of form of, on separation of rare earths, 9: 113(J), 5919(J)
equilibrium constants, infrared spectrophotometric determination, 9: 7729(J)
operation of ion-exchange resin columns for rare-earth separation, 9: 6621(J)
selective behavior of, 9: 118(J)

Ion pair production
in argon-filled, 8-in.-diam. spherical steel ion chamber from cosmic radiation, 9: 4490
by fast primary particle, derivation of distributions, 9: 4003(J)

Ion-scattering analysis
model for collision processes in gases, 9: 5398

Ion sources
(Covering radiation from nonradioactive sources; see also headings identified by radiation, e.g., Neutron sources; see also appropriate subheadings under specific accelerators; see also Nitrogen ion sources.)
behavior of electron beam type, in mass spectrometer, 9: 6395(J)
curved arc, design, 9: 5562(P)
design, 9: 1442(P), 5558(P)
design and performance of, for 184-in. cyclotron, 9: 3662
design and performance of Bevatron, 9: 5510
design of, for electromagnetic separation of Sr isotopes, 9: 1593
design of, for multiple beam type calutron, 9: 8013(P)
design of, to eliminate memory effect and source geometry changes in mass spectrometry, 9: 5560(P)
design of high-current pulsed, for Van de Graaff accelerator, 9: 3666(J)
design of high-frequency, 9: 1583(J)
design of high-intensity, 9: 1587(J)
design of improved, for mass spectrometers for analysis of solids, 9: 1595(J)
design of point field-emission, for mass spectrometry, 9: 2136(R)
development, of a calutron containing multiple, 9: 8011(P)
electrical control circuit in, 9: 7995(P)
electrical discharge in, automatic control, 9: 7996(P)
for electron irradiation, equipment design, 9: 4705(R)
high-frequency, design, 9: 5512(J)
hydrogen, measurement of variables, 9: 2388(J)
mass-spectrometer, electron current and energy regulator for, 9: 1031(J)
for mass spectrometer, trap-current controlled emission regulator for, 9: 2408
for negative ions, design, 9: 2471
occluded gas, design, 9: 7824
operational characteristics of types of, 9: 7059
positive, design and performance of point emitter as, 9: 5080
potential distribution in mass spectrometer, effect of space charge, 9: 7064(J)
pulsable, design, 9: 3307(J)
r-f, performance, 9: 4204(R)
structure, 9: 8008(P)
temperature control system for volatilization process, 9: 7994(P)
without auxiliary magnetic field for mass spectrometer, 9: 5103(J)

Ionization
(See also Dissociation; see also appropriate subheadings under Gases and under specific materials and radiations.)
atomic, accompanying β emission in Y^{90} and RaE, 9: 6535(J)
from cobalt (Co^{60}) at various distances, intensity of, 9: 5793(J)
efficiencies and cross sections of photo, in O_2, N_2, Co_2, A, H_2O, H_2, and CH_4, 9: 6747(J)
energy loss of a fast primary particle by, derivation of distributions
gaseous, dual gage for, design and performance, 9: 2820(R)
of gases, concentration of ions as a function of pressure, 9: 6702
in nuclear emulsions, measurement, 9: 5797(J)
photometric measurement of, in cloud chambers, 9: 6727(J)
probability curves of, apparatus for obtaining, 9: 999(J)

Ionization chambers
acoustic, for neutron flux measurement, 9: 7070(R)
behavior of flat-plate type, under continuous α irradiation, 9: 1968(J)
calibration of 50- and 900-cc, 9: 3924
characteristics of gridded parallel-plate, 9: 1599
containing BF_3, calibration of, for fast neutron detection, 9: 5422
continuous-flow, automatic pressure-regulating device for, 9: 5110
cosmic ray, design, 9: 1066(R)
design and filling equipment, 9: 3965(R)
design and performance, 9: 318(J)
design and performance for integral dose measurements in betatron radiation therapy, 9: 2878(J)
design and performance of, for measuring concentration of tritium in hydrogen, 9: 4511
design and theory, 9: 7859(J)
design for β-γ radioactivity of the atmosphere, 9: 1326(J)
design for continuous monitoring of tritium in air, 9: 7450
design of, for neutron detection, 9: 8016(P)
design of Kanne chamber for measuring radiogases, 9: 1038
design of pocket integrating, of nearly uniform polar response, 9: 4249(J)
for detection of neutron flux in a reactor, design, 9: 3589
electrostatic fields of, measurement of distortion produced in guarded, by grounded external plates, 9: 314(J)
extrapolation, design and operation, 9: 7464(J)
filling of fast, insensitive to oxygen contamination, 9: 5736(J)
filling with A–N_2 mixtures, advantages, 9: 3949(J)
in neutron flux measurement systems, 9: 7454(R)
performance, 9: 2539(R)
performance of, for dosimetry of small high-energy x-ray beams, 9: 2879(J)
performance of, for measurement of Co^{60} γ radiation, 9: 1978(J)
performance of, in determinations of radiation dosage in tissues, 9: 3256(J)
performance of, in fission counting, 9: 2821
performance of, in measurement of C^{14}–activity from human breath, 9: 3940(J)
performance of, in detection of neutrons and of γ radiation, 9: 6820(R)
portable, for radon measurements, design of, 9: 2855
preparation and properties of thin polyvinylchloride-acetate copolymer films for 4π counting in, 9: 1613(J)
pulse analysis with, 9: 7448
standard free-air, plate separation requirements, 9: 1331(J)
tissue-equivalent, for detection of fast neutrons, performance, 9: 3951(J)

Ions
(See also Anions; Cations; Gaseous ions.)
break-up of negative, in the cyclotron, 9: 4879(J)
capture and loss cross sections for, of Z = 8 to 18 passing through gases, 9: 5808(J)
charge exchange between fast, and neutral ions, 9: 7044
colorimetric determination, annular oven method and spot testing in, 9: 3781

Ions (cont'd)
complex metal solvent extraction, 9: 4980
concentration of, as a function of pressure, 9: 6702
drainage of, in magnetically focused electron beams, 9: 7406(J)
effects of, on the nucleation processes in liquids, 9: 2663(J)
electron capture and loss by moving, in dense media, 9: 1563(J)
electronic polarizabilities of, from the Hartree-Fock wave functions, 9: 7407(J)
with electrons, self-focusing properties of streams of, 9: 5695(J)
emission of positive, 9: 6820(R)
heavy, of high energy, acceleration and nuclear reactions, 9: 7103(J)
mass ratio determinations by cyclotron resonance in omegatron, 9: 5166
metal, polynuclear hydrolysis reactions of, 9: 1469(J)
positive, quantitative detection by electron multiplier, 9: 1051(J)
separation of, in a single drop, 9: 1786(J)
simple analytic wave functions for configurations $(1s)^2(2s)$ and $(1s)^2(2s)^2$ in, from He to C, 9: 4339(J)
single ion free energies and entropies of aqueous, 9: 2142(J)
tables of statistical electron distributions for, and corresponding electrostatic potentials, 9: 69(J)
Iowa State Coll., Ames
progress report on organo-metallic and organo-metalloidal high temperature lubricants and related materials, 9: 4091(R), 5681(R)
progress reports on thermal decomposition of lubricants, 9: 3805(R)
Iridium
complexes, magnetic moments of octahedral, 9: 1749(J)
determination of, as sulfide, 9: 82(J)
intermetallic compound with Nb, preparation and structure, 9: 3878(J)
nuclear isomers, 9: 1067(R)
proton reactions and radiochemical study, 9: 4864
separation from Pd, Pt, and Rh, by ion exchange, 9: 7988(P)
Iridium fluorides
preparation of complex, 9: 2188(J)
Iridium isotopes
exchange of radioactive, between $IrCl_6^{-2}$ and $IrCl_6^{-3}$ ions in 1 f HCl, 9: 3770(J)
Szilard-Chalmers concentration, 9: 1959(J)
Iridium isotopes Ir^{190}
production with 70-Mev bremsstrahlung irradiation, 9: 7105
Iridium isotopes Ir^{191}
identification of 0.125-Mev x radiation from, 9: 436(J)
metastable states, 9: 7128(J)
nuclear properties, 9: 1356(J)
nuclear properties, decay scheme, and energy levels, 9: 1355(J)
Iridium isotopes Ir^{192}
disintegration, 9: 1677(J)
gamma spectra, 9: 988(R)
photon and electron spectra of Ir^{192}, 9: 438(J)
radiographic applications, 9: 2241(J)
Iridium isotopes Ir^{194}
decay scheme, 9: 4329(J)
disintegration, 9: 1677(J)
production with 70-Mev bremsstrahlung irradiation, 9: 7105
Iridium–platinum alloys
number of vacancies and energy of vacancy formation in, 9: 3525(J)
Iridium–uranium alloys
crystal structure of UIr_2, 9: 6944(J)
Iron
(See also Cast iron; Steel.)
Iron (cont'd)
adsorption of O_2, H_2, and CO on evaporated films of, 9: 2159(J)
angular distribution, cross sections, and γ rays excited by scattered neutrons, 9: 3993(R)
atomic form factors, calculation and survey, 9: 7407(J)
behavior in bicarbonate solutions, 9: 6648(J)
colorimetric determination of, in Al alloys, 9: 5600(J)
corrosion by Bi–Pb–Sn alloy at elevated temperatures, 9: 6659
corrosion by nitric oxide at high temperature, 9: 6308(J)
corrosion in 1000°F liquid Na, effect O_2 on, 9: 948
corrosion by water, texture of γ-$Fe_2O_3 \cdot H_2O$ crystals from, 9: 886(J)
corrosion of, inhibition by pertechnetate, 9: 1825
corrosion of Globeiron by liquid Na, 9: 1901(R), 1903(R)
corrosion prevention of, by metal spraying, 9: 3150(J)
corrosion testing, methods for cleaning exposed specimens for, 9: 952(J)
corrosion, welding, and mechanical properties, review, 9: 7368(J)
cosmic shower production in, 9: 2814(J)
cross section measurements with collimated fission neutron source, 9: 7957
cross sections for neutron transmission and multiplication, 9: 3646(J)
curved-crystal x-ray spectrometric microdetermination of, in Al alloys, 9: 3435(J)
detection of inclusions of, in Al by colorimetric spot tests, 9: 1196
determination in Fe alloys, 9: 1901(R)
determination in U by ion exchange, 9: 884(J), 1793(J)
determination of, in high-temperature alloys using anion-exchange separations, 9: 1544(J)
determination of, in mixtures with Th, Zr, and Ti, by use of 2,4-dichlorophenoxyacetic acid, 9: 2641(J)
determination of micro quantities of Hf, Nb, Ta, U, and Th in, 9: 4382
determination of the coefficient of self-diffusion of, in C-Fe-Si and C-Fe-N systems, 9: 5067(J)
differential neutron elastic scattering cross sections at 4.1 Mev, 9: 4597(J)
diffusion in Fe–Mo alloys, effect of alloy compositions on, 9: 7794
diffusion in Fe–Ni alloys, effect of alloy compositions on, 9: 7793
diffusion in stainless steel, determination by tracer methods, 9: 7015(J)
diffusion of H_2 in, 9: 2297, 3191(J)
effects of H on, 9: 1272(J)
elastic scattering of high-energy polarized protons by, 9: 4885
electrodeposition of, on Nb, 9: 5351
electroforming from ferrous chloride and fluoborate baths, 9: 3495
electron emission from, bombarded by hydrogen ions, 9: 250(J)
electroplating and roll-bonding to Ti, 9: 3477(R)
elastic scattering of polarized protons from, 9: 4893(J)
external bremsstrahlung emitted from P^{32} β rays stopped in, 9: 2505(J)
fatigue, minimum scatter in, 9: 1816
fatigue and stress, 9: 4159
film-surface area of evaporated, measurement, 9: 3887(J)
flame spectrophotometric determination of, in siliceous materials, 9: 5606(J)
gamma attenuation, 9: 1656, 2983
gamma penetration, tables and graphs, 9: 2472
Globeiron, heat transfer and corrosion tests on, 9: 2776(J)
Globeiron fuel cladding for a Na-cooled fast reactor, tests, 9: 2776(J)
inclusions non-metallic, radiographic investigation of, 9: 7800(J)
incorporation into hemin, effects of irradiation on, in laboratory animals, tracer study, 9: 4914(J)
inelastic neutron scattering in, γ spectra from, 9: 419(J)

Iron (cont'd)
interferometric wavelengths of lines of, from a hollow cathode discharge, 9: 4757(J)
large angle scattering of μ mesons in, 9: 3322(J)
magnetic properties, 9: 7166
magnetic properties of, for synchrotron magnets, 9: 6494
μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)
metabolism, effects of total-body x irradiation on, in duck erythrocytes, 9: 2580(J)
neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)
neutron inelastic scattering cross section, 9: 988(R)
neutron reactions (n,γ), theory, 9: 3619(J)
neutron reactions (n,nγ) at 4.5 Mev, γ rays from, 9: 4589(J)
neutron reactions (n,π^0), 400 Mev cross section, 9: 5742(J)
neutron reactions (n,π^-) at 400 Mev, cross section, 9: 6011(J)
neutron total cross sections, 9: 7124(J)
nuclear and magnetic scattering amplitudes for, from neutron polarization studies, 9: 1658(J)
passive film on, electrical field within, 9: 1868(J)
phase studies and Curie points, 9: 4453
photon reactions (γ,n), 250 Mev, 9: 6772(J)
polarographic determination of, in Ti-base alloys, 9: 6290
polarization of thermal neutrons by noncrystalline, 9: 1627(J)
potentiometric determination of, by x-ray oxidation of ferrous solutions, 9: 2644(J)
proton range in, 1- to 7-Mev, 9: 6788(J)
purification by removal of S into slag of system $CaO-Al_2O_3$, 9: 7683(J)
purification by zone melting, 9: 1855(R)
radioactivity induced in by pile radiation, 9: 6105
radiochemical determination, 9: 876
radiometric determination, 9: 2634
reaction with fused NaOH, 9: 1466(R)
removal of layers of, from Ni by electrolytic polishing, 9: 3874
self-diffusion in, by surface activity method, 9: 5248
self-diffusion in C–Fe systems, 9: 7269(R)
self-diffusion in molten carbon-saturated Fe, 9: 4437(R)
separation from Pa by ion exchange in HCl–HF solutions, 9: 3102(J)
slowing down of Ra-α-Be neutrons, 9: 1105
solubility in NaK, equipment and procedures for studying, 9: 3501
specific heat of, to 600°C, 9: 185
spectrographic determination in Bi, 9: 1475
spectrographic determination in Ti and Ti alloys, 9: 639(R)
spectrophotometric determination of, in presence of U with 1,10-phenanthroline, 9: 4074
spectrophotometric determination of, in Ti alloys, 9: 84(J)
tissue distribution of subcutaneously injected, in young rats, effects of radiation on, tracer study, 9: 3050(J)
titanium in, book on, 9: 7385(J)
tritium production by 2.2-Bev protons on, and its relation to cosmic radiation, 9: 3651(J)
uptake by erythrocytes, effects of total-body irradiation on, in ducks, tracer study, 9: 5230(J)
uptake by human bone marrow cells, tracer study, 9: 3011(J)
uptake of, by blood cells, effects of whole-body x irradiation on, in ducks, 9: 1155
uptake of, by erythrocytes in bone marrow, tracer study, 9: 3007
urinary excretion of, effects of Na diethanolamine acetate on, 9: 1739
volume and grain boundary diffusion of Sn in, study of by radioautography, 9: 7360(J)

Iron (cont'd)
volumetric and colorimetric determinations of, in Ti and Ti alloys, 9: 4944
wetting with sodium silicate glass, 9: 6646(R)
x-ray spectra (soft), 9: 452(J)

Iron alloys
casting and forging for gas turbine application, 9: 3869
corrosion by liquid Na, 9: 1902(R)
descaling methods for, corroded by high-temperature water, 9: 154
fatigue and stress, 9: 4159
production, physico-chemical principles of, 9: 640
rupture and tensile tests on wrought Fe-Mn-Cr austenitic steel and cast F-88 and F-87 alloys, 9: 2720(R)

Iron–aluminum alloys
crystal structure, 9: 2311(J)
thermodynamic properties, 9: 2294(R)

Iron–aluminum–beryllium alloys
crystal structure, 9: 2310(J)

Iron–aluminum–molybdenum alloys
corrosion by water, 9: 6946(R)

Iron–aluminum–silicon systems
equilibrium diagram of, established by liquation, 9: 6323(J)

Iron–aluminum–titanium alloys
fabrication and physical properties, 9: 2717(R)
hardness, crystal structure, and phase studies, 9: 3520

Iron–boron–chromium–nickel systems
preparation, casting into ingots, and fabrication into strips, 9: 6994

Iron–carbon–cobalt systems
diffusion of C in, influence of Co, 9: 1869(J)

Iron–carbon–nickel systems
coefficient of self-diffusion of Fe in, 9: 5067(J)
equilibrium constant as a function of C content for, 9: 6279
phase studies, 9: 2317(J)

Iron–carbon–silicon systems
coefficient of self-diffusion of Fe in, 9: 5067(J)

Iron–carbon systems
diffusion of Fe in, 9: 7269(R)
equilibrium constant as a function of austenite composition, 9: 6279
interfacial and surface energies, 9: 6286(R)
preparation, microstructure, and phase studies, 9: 1265(R)
size of interstitial solute atoms, lattice expansion and electronic properties of close-packed, 9: 1780(J)
surface tension, 9: 2702(R)

Iron carbonyls
neutron scattering cross sections and x-ray diffraction correlation, 9: 7169(J)
powders, density measured by gas burette, 9: 1290(J)

Iron–chromium alloys
creep, heat treatment, and tensile properties, 9: 2724
creep, tensile properties, alloying effect of Co, Mo, and Ni on, preparation, 9: 6289
dilatometric determination of $\alpha \rightleftharpoons \sigma$ transformation, 9: 3537(J)
forgeable high-strength, high-temperature, preparation of, effects of additives, 9: 3522
neutron-diffraction studies of magnetic structure of, 9: 2312(J)

Iron–chromium–cobalt alloys
coefficients of linear thermal expansion between temperature ranges −65° and +800°C and phase studies, 9: 7384(J)

Iron–chromium–cobalt–nickel alloys
analysis of, using anion-exchange separations, 9: 1544(J)
weldability of wrought, 9: 3530(J)

Iron–chromium–manganese–molybdenum–titanium alloys
mechanical properties and microstructure of extruded and heat treated, effects of temperature, pressure, and die angle on, 9: 2276(R)

Iron–chromium–manganese–molybdenum–titanium–vanadium alloys
heat treatment, mechanical properties, phase studies, tensile properties, and welding, 9: 2298
tensile properties, hardness, and flash weldability, 9: 3856

Iron–chromium–molybdenum–nickel alloys
tensile properties, creep-rupture at 1350 and 1500°F, and microstructure, 9: 3859

Iron–chromium–molybdenum–titanium alloys
tensile properties and ductility, 9: 1848(R)

Iron–chromium–nickel alloys
vacuum melting and casting, 9: 2727(R)

Iron–chromium–titanium alloys
creep of heat-treated and as-received, at 76 and 600°F, 9: 3478(R)
creep of hot-rolled and annealed, at 76 and 600°F, aging effects on, 9: 3479(R)
creep of Ti 150A, 9: 168(R)
drilling tests, 9: 3544(J)
effects of creep testing on room-temperature tensile properties of heat-treated and hot-rolled, 9: 2279(R)
machining and grinding, 9: 4174
machining characteristics of forged Ti-150A, 9: 4168
tensile properties and rupture at 800°F of hot-rolled, 9: 2275(R)
tensile properties at room temperature, effects of creep test conditions on, 9: 2275(R)

Iron complexes
with 2,2-bipyridine, chemical properties, 9: 512
with SCN^-, formation, reaction kinetics, 9: 6880

Iron compounds
polarographic behavior of, in molten ammonium formate, 9: 7292

Iron(II) compounds
aqueous, x-ray oxidation of, potentiometric determination of Fe by, 9: 2644(J)

Iron(III) compounds
radiolysis of aqueous solutions, 9: 7718(J)

Iron crystals
single, mechanical properties, effects of neutron irradiation on, 9: 6926

Iron cyanides
isotopic exchange reactions between ferrocyanide-ferricyanide, 9: 530(J)

Iron(II) fluorides
crystal structure, 9: 92(J), 6912(J)

Iron–germanium alloys
phase studies, 9: 3184(J)

Iron hydrides
preparation of, by reaction with atomic H, 9: 635(R)

Iron hydroxides
effects of Co^{60} γ radiation on, 9: 6444(R)

Iron ions
equilibrium formation constants for reaction in aqueous solution of acetylacetonate ion with, 9: 1752(J)

Iron(II) ions
oxidation, determination of G values for, 9: 899
oxidation, radiation-induced, 9: 6927(J)

Iron(III) ions
photoinitiated oxidation of benzoic acid by, in aqueous solution, 9: 3061
polarographic reduction, in fluoride media, 9: 4736(J)
reaction with thiocyanate ion, kinetics, 9: 4705(R)
reduction by hydroquinone in presence of 1,10-phenanthroline, 9: 5596(J)
x-ray photometric determination of, 9: 899

Iron isotopes Fe^{54}
gamma reactions (γ,n), 9: 6090(J)
neutron reactions (n,γ), energy level assignment from, 9: 7912(J)
neutron reactions (n,γ), γ radiation from, 9: 7545(J)

Iron isotopes Fe^{55}
assay in biological samples, 9: 4733(J)
beta decay and K capture, autoionization effects due to, 9: 6465(J)
bremsstrahlung from radiative electron capture, 9: 401(R)
diffusion in stainless steel, 9: 7015(J)

Iron isotopes Fe^{56}
energy levels and cross sections of, from neutron scattering by Fe at 4.4 Mev, 9: 4590(J)
energy levels by inelastic scattering of 15-Mev neutrons, 9: 4561(J)
neutron reactions (n,γ), energy level assignment from, 9: 7912(J)
neutron reactions (n,γ), γ radiation from, 9: 7545(J)
proton inelastic scattering from, direct interaction in, 9: 1114(J)

Iron isotopes Fe^{57}
Coulomb excitation functions and energy levels for, bombarded with 3.5-Mev α particles, 9: 423(J)
energy levels from decay of Co^{57}, 9: 6798(J)

Iron isotopes Fe^{59}
analysis of β-decay, 9: 7579(J)
assay in biological samples, 9: 4733(J)
estimating, in Fe^{59}–Cr^{51} mixtures in blood, 9: 7461(J)

Iron–molybdenum alloys
catastrophic oxidation of, effect of Ni and Cr on, 9: 1275(J)
constitution diagrams, creep, hardness, and tensile properties, effects of heat treatment on, 9: 4470(J)
diffusion of Fe in, effect of alloy compositions on, 9: 7794
oxidation kinetics, 9: 1274(J)

Iron–molybdenum–nickel alloys
oxidation at 920 and 1110°C, 9: 3146

Iron–molybdenum–titanium alloys
hardness, heat treatment, mechanical properties, phase studies and welding, 9: 2298

Iron–nickel alloys
diffusion of Fe in, effect of alloy compositions on, 9: 7793
diffusionless phase transformation and crystal structure, 9: 1861
heat treatment, controlled atmospheres for, 9: 6279
magnetic properties, 9: 1067(R)
neutron-diffraction studies of magnetic structure of, 9: 2312(J)
oxidation at high temperatures, 9: 6307(J)
superlattice formation of, in steady temperature annealing, 9: 2773(J)

Iron–nickel–uranium alloys
pseudo-binary phase sections between Laves phases in, 9: 3353(J)

Iron–niobium alloys
potassium carbonate fusion of, for production of Nb_2O_5, 9: 2666

Iron nitrides
precipitation of, in isothermal annealing of carbonyl Fe powders, 9: 1862

Iron–nitrogen systems
size of interstitial solute atoms, lattice expansion, and electronic properties of close-packed, 9: 1780(J)

Iron–nitrogen systems (cont'd)
surface tension, 9: 2702(R)
surface tension and wettability, measurements of, 9: 653(R)

Iron oxide crystals
texture of, from corrosion of Fe by water, 9: 886(J)

Iron oxides
heat and free energy of formation, 9: 529(J)
isotopic equilibration determination of O in, 9: 3394

Iron(II) oxides
colloidal particles of Fe_2O_3, size determination of, by optical methods, 9: 6423(J)

Iron–oxygen systems
isotopic equilibration determination of O in, 9: 3394
surface tension, 9: 2702(R)

Iron–oxygen–titanium systems
phase studies, 9: 1874(J)

Iron powders
effects of isothermal annealing on structure and properties of, x-ray-diffraction studies, 9: 1862(R)

Iron–selenium systems
surface tension, 9: 2702(R)

Iron silicates
electrolysis, equipment for, 9: 5642(J)

Iron sulfate–copper sulfate systems (liquid)
radiation chemistry of aqueous solutions of, 9: 2661(J)

Iron(II) sulfates
absolute yield of Fe^{3+} from dilute aqueous solutions of, exposed to 200-kv x rays, 9: 108(J)
ferrous sulfate–lithium sulfate systems, effects of radiation on, 9: 6106(J)
radioinduced oxidation of, 9: 899

Iron sulfides
molten, self-diffusion of Fe, 9: 1467(R)
self-diffusion coefficient of Fe in molten, 9: 2135(R)

Iron–tellurium systems
surface tension, 9: 2702(R)

Iron titanates
crystal structure, 9: 3844(R)
heat contents of ferric titanates and titanomagnetite up to 1739 and 1513°K, respectively, 9: 4375(J)

Iron–titanium alloys
electric resistance, phase studies, and microstructure of heat-treated, 9: 975
grain-boundary diffusion in, as bonding agent between Ti and steel, 9: 4182
heat of formation, 9: 7814(J)
martensite formation and hardness in powders and lump specimens of, 9: 1547(J)
mechanical properties, effect of microstructure, 9: 4172
oxygen content and oxide phase equilibrium with, 9: 1546(J)
precipitation hardening, heat treatment, and embrittlement of high-strength, 9: 4462

Iron–titanium–vanadium alloys
fabrication and physical properties, 9: 2717(R)
microstructure, hardness, and tensile properties of welded and unwelded, 9: 3493(R)

Iron–zirconium alloys
corrosion resistance in 680°F water, effect of heat treatment on, 9: 7331
creep-rupture, 9: 190(R)
tensile properties of particle-strengthened, 9: 7353

Irradiation chambers
(See Radiation exposure chambers.)

Irradiation techniques
for cyclotron radiation damage studies, 9: 430(J)
field irradiation machine using Co^{60}, 9: 7571(J)
high-temperature underwater irradiation facility, design, 9: 4621(J)
for irradiation of pituitary gland with high-energy proton beams, 9: 784

Isomeric transition
(See also appropriate subheadings under specific isotopes.)
electric dipole, isotopic spin selection rule for, 9: 4325(J)
energy of Ir^{192m}, from conversion electron studies, 9: 438(J)
lifetimes of E2 and M1 + E2 transitions in even-even and odd-A nuclei, 9: 4632(J)
mixed M_1 and E_2, explanation of, 9: 6462(J)

Isoniazid
pharmacological effects of, in vitamin B_6-deficient rats, 9: 7607(J)

Isonipecotic acid, 1-methyl- 4-phenyl-, ethyl ester chlorohydrates
x-ray protection of guinea pigs injected with, 9: 43(J)

Isopropyl ether
effects of electrons on, 9: 4705(R)
radiolysis of, with γ rays, comparison with He-ion and electron irradiations, 9: 61(R)

Isotope effects
carbon, in decarboxylation of mono-anion of malonic acid in quinoline solution, 9: 6888(J)
carbon (C^{14}) in study of the Dieckmann condensation of diethyl phenylene-diacetate, 9: 6632(J)
of electrolytic diffusion of K ion in molten KNO_3, 9: 5387(J)
hydrogen, in study of transition complex H_2Cl, 9: 6894(J)
review, 9: 7851(J)
statistical thermodynamics of, 9: 1418

Isotope separation methods
(See also appropriate subheadings under specific isotopes.)
bibliography on, 9: 288
chemical separation of isotopes as a problem of rectification, 9: 1960(J)
electrolysis, 9: 289
electrolytic, for separation of H isotopes, 9: 1435(P)
electrolytic conversion in LiCl for Li^6, 9: 6391(J)
electrolytic separation of H and D, effect of nitrate ion and NH_3 on, 9: 1594(J)
electromagnetic apparatus and collection of gaseous isotopes, 9: 3247
electromigration on paper, 9: 6393(J)
ionic expansion in a magnetic field, theoretical discussion of, 9: 6394(J)
nuclear recoil, 9: 1958(J)
ratio determination, two-stage magnetic analyzer for, 9: 6000(J)
for separation of N isotopes by ion exchange, 9: 3246(J)
thermal diffusion, 9: 4505(J)
thermal diffusion column for separation of tritium, 9: 6392(J)
ultrasonic, for gaseous mixtures, 9: 5415(J)
using countercurrent chemical exchange, theory, 9: 2838
using Szilard-Chalmers reactions in metal complexes of phthalocyanine, 9: 1959(J)

Isotopes
(See also specific isotopes; see also Radioisotopes; Stable isotopes; Tracer techniques.)
chemical and physical properties, production, natural occurrence, and tracer applications, 9: 7848(J)
determination of molecular structure and chemical reactivity with, 9: 7713(J)
electromagnetically enriched non-radioactive, production at Harwell, 9: 2493(J)

Isotopes (cont'd)
enriched non-radioactive, production at Oak Ridge National Lab., 9: 2402(J)
geological applications, book on, 9: 5950(J)
migration and selfmigration in metals, 9: 1954(J)
properties and applications in the field of physical chemistry, review, 9: 3582(J)
relative abundance of, in earth's crust, effect of diffusion, 9: 3464(J)
separation by electromigration on paper, 9: 6393(J)
table of α-decay energies for heavy, 9: 806(J)

Isotopic equilibration
dilution method for chemical analysis, 9: 3783(J)

Isotopic equilibration analysis
of O in metals and metal oxides, design and performance of equipment for, 9: 3394

Isotopic exchange
in addition compounds and metal complexes, tracer studies, 9: 7714(J)
between tricalcium phosphate and Ca or phosphate solutions, 9: 90(J)
bibliography on, 9: 288
complex reaction mechanisms, theoretical treatment of, 9: 1182
kinetics of, under dynamic conditions, 9: 3767(J)
kinetics of, with appreciable isotope effect, 9: 1030(J)
of manganese in the Mn^{++} and MnO_4^- reaction, 9: 6631
reaction kinetics, 9: 3391
reaction of carbonate ion and the carbonato-tetrammino-cobalt complex ion, absence in the, 9: 6939(J)
reactions of PCl_5 in CCl_4, 9: 4373(J)

Italy
nuclear research programs, 9: 2908(J)

J

Jack Pile Mine (N. Mex.)
occurrence of soddyite in, 9: 5948(R)

Jaw Bone Mining District (Calif.)
geology, mineralogy, and uranium distribution, 9: 3154

Jeep No. 2 Claim (Calif.)
geology and U distribution, 9: 2708

JEEP Reactor
neutron flux distribution in concrete shield, 9: 749
temperature measurements and reactivity, 9: 3976
transfer function of, effect of photoneutrons on, 9: 1084(J)
velocity distribution of escaping neutrons from, measurements, 9: 3980(J)

Jet engine fuels
cleaning, 9: 136(R), 2795(R), 3123(R)
cleaning, corrosive effects, 9: 6949(R)
dirtiness at high temperatures, testing, 9: 4484(R)

Jet Propulsion Lab., Calif. Inst. of Tech.
(See California Inst. of Tech., Pasadena. Jet Propulsion Lab.)

Jet pumps
design, 9: 1818(J)

Joe Davis Hill Quadrangle (Colo.)
preliminary geologic map of, 9: 4153(J)

Johns Hopkins Univ., Baltimore
progress reports on nuclear γ rays, 9: 401(R)

Joint Establishment for Nuclear Energy Research, Kjeller, Norway
progress reports on research, 9: 3717(R)

Journal bearings
performance and stability of air-lubricated, 9: 7844

Juanita Arch Quadrangle (Colo.)
preliminary geologic map of, 9: 6271(J)

Juneau Area (Alaska)
geology, mineralogy, and exploration, 9: 6967(J)

K

K particles
beta decay of, 9: 325(J)
capture of K^- mesons, 9: 4262(J)
decay, 9: 5455(J)
decay and production by 5.7-bev protons, 9: 3966(R)
decay processes, 9: 5131(J)
decay of, into a π meson and four electrons, possible observation of, 9: 1059(J)
decay of, to a 50-Mev electron, 9: 724(J)
decay studies, 9: 2099(R)
detection of nuclear capture of, at 1750 m, 9: 1607(J)
disintegration and electron emission, 9: 5450
electron decay, 9: 4549(J)
evidence for, and characteristics of a K_μ particle, 9: 6430(J)
interaction of fast, 9: 4541(J)
interaction with nucleons, 9: 7475(J)
mass, 9: 6026(J)
mass estimates and decay made from S events, 9: 5134(J)
mass measurements and decay schemes, 9: 5132(J)
mass measurements and stars from, 9: 6035(R)
mass measurements of, and decay products, 9: 2890(R)
mass, momentum, and range-energy relations, 9: 5129
measurements on, and their secondaries, 9: 6024(J)
negative, observations on, 9: 3272(J)
nuclear interactions, 9: 3960(J)
observation by counter selection system and cloud chamber, 9: 3955(J)
observation of, in decay of hyperon Y_1^-, 9: 339(J)
observation of $K_{\pi 2} \rightarrow \pi + \pi^0$ events, 9: 5462(J)
production from 2.7- Bev p-p collisions, 9: 6038(J)
properties of, from absorption experiments, 9: 6025(J)
review of, in Annual Review of Nuclear Science, 9: 3957(J)
secondaries, identification and measurement, 9: 5133(J)
tracks, analysis, 9: 4540(J)

Kaiparowits Peak Quadrangle (Utah)
photogeologic map of, 9: 3469(J), 3835(J)

Kaiparowits Plateau Area (Utah)
exploration, 9: 3466(J)

Kaiser Aluminum and Chemical Corp., Spokane
progress reports on fabrication of Al alloys by powder metallurgy, 9: 5354(R)

Kansas
radioactivity in oil deposits in, in Butler, Cowley, Greenwood, Marion, and Sedgwick counties, 9: 1517(J)

Kansas. Univ., Lawrence
progress reports on Van de Graaff generator projects, 9: 5782(R)

Kaolins
effects of porosity on constant rate filtration, 9: 5302(J)

Kayenta Formation (Colo.)

geology of, in Horse Range Mesa Quadrangle, 9: 7775(J)

Kentucky. Univ., Lexington, Kentucky Research Foundation

progress reports on preferred orientations and deformation in Ti and Ti alloys, 9: 1836(R)

progress reports on scaling of Ti and Ti alloys, 9: 4790(R), 6263(R)

Kerosene–acetone, thenoyltrifluoro-–butyl phosphate systems

solvent extraction of Pr and Nd in, 9: 906

Kerosene–butyl phosphate systems

mechanism of U extraction by, 9: 585

solvent extraction of Pr and Nd in, 9: 906

Ketchikan Area (Alaska)

geology, mineralogy, and exploration, 9: 6967(J)

Ketones

(See also Diketones.)

enolization, tritium isotope effect for hydronium ion catalysis, 9: 4205(R)

isotopic exchange of H atoms in, 9: 7713(J)

Kidneys

effects of total-body irradiation on, in chickens, 9: 3(R)

effects of tubular injury on urinary excretion of fluoride by, in the rabbits, 9: 1730(J)

excretion of iodides by, tracer study, 9: 5878(J)

function, effects of radiation on, 9: 6837(J)

function of, correlation with I^{131} clearance in hyperthyroidism and myxedema, 9: 1180(J)

radiosensitivity of, in rats, 9: 2547(R)

Kilns

(See also Furnaces; Ovens.)

rotary, for production of zirconia, 9: 151(J)

King No. 1 Claim (Ariz.)

uranium distribution, geology, and mineralogy, 9: 7759

King Tut Mesa (Ariz.–N. Mex.)

exploration and geology, 9: 2262(R)

Kinusta Mesa (Ariz.)

stratigraphy, 9: 2262(R)

Kirtland Quadrangle (N. Mex.)

preliminary geologic map of, 9: 5331(J)

Kolob Terrace Area (Utah)

exploration, 9: 3466(J)

Koyukuk District (Alaska)

prospecting and geology, 9: 628(J)

Krypton

absorption on Al powders for measurement of surface areas, 9: 4163(R)

adsorption on rutile, 9: 3113(J)

energy exchange between, and graphite at elevated temperatures, 9: 5908(J)

energy loss of positive ions single scattered in, 9: 1377(J)

fission yield of, in neutron fission of U^{235} and U^{238}, 9: 7601(J)

ionic species formed by collision of gaseous ions in, 9: 1378(J)

solidified, compressibilities at low temperature, 9: 2824(J)

stopping of deuterons and protons in, 9: 5803(J)

virial coefficients, crystal properties, and heat of sublimation at 0°K, 9: 7843(J)

x-ray absorption, 9: 4524(J)

Krypton isotopes

decay schemes, measurements and interpretation, 9: 3332(J)

use in standard wave length light sources, 9: 6717(J)

Krypton isotopes Kr^{79}

disintegration, 9: 1413(J)

electron capture (K and L) of, by Wilson cloud chamber and proportional counter methods, and decay scheme, 9: 7426(J)

L to K capture ratio of, disagreement with theory, 9: 6527(J)

L to K capture ratio of, proportional counter method of measurement of, 9: 6528(J)

Krypton isotopes Kr^{85}

counting of, techniques and equipment, 9: 300

Laboratories

(See also Caves.)

design, 9: 6187

design and construction, 9: 7306

design of, for radioisotope work, 9: 4098(J)

for handling and machining irradiated samples, design, 9: 553(J)

high-radiation-level analytical, design, 9: 550(J)

for industrial atomic control analysis and development work, design, 9: 698

liquid waste disposal systems, equipment for, 9: 6636

low-level radiation metallurgy, design, 9: 551(J)

for radiochemistry and metallurgy, design, 9: 554(J)

for radium processing, design, 9: 552(J)

for remote processing of reactor fuel elements, design, 9: 558(J)

Laboratories for Research and Development, Franklin Institute

(See Franklin Inst. Labs. for Research and Development, Philadelphia.)

Laboratory equipment

(See also Remote-control equipment; Servomechanisms.)

application, description, and operation, 9: 6187

contaminated, disposal by burial, 9: 4417(J)

contamination, 9: 6804(J)

design and performance, 9: 7306

large volume cell for titrations and conductometric analyses, design, 9: 4094

master-slave manipulator, design, 9: 555(J), 556(J), 557(J)

microforceps, pneumatically controlled, design, 9: 3092(J)

noncorrosive, effectiveness of graphite as a structural material, 9: 3421(J)

for nuclear chemistry, bibliographies, 9: 6186

for radiochemistry procedures, design, 9: 576(J)

for remote chemical separations, design, 9: 570(J), 571(J)

for remotely-controlled pipetting of micro-amounts, design, 9: 559(J)

Laboratory for Nuclear Science, Mass. Inst. of Tech.

(See Massachusetts Inst. of Tech., Cambridge. Lab. for Nuclear Science and Engineering.)

Laboratory furniture

(Including hoods, benches, sinks, etc.; see also Dry boxes.)

design of a sectional dry box, 9: 5284

a self-contained unit for collecting and disposing of chemical fumes, mists, and gases, design, 9: 932

Lactates

degradation of C^{14}-labeled, using a combined combustion-diffusion vessel, 9: 2178(J)

Lactic acid

electroösmosis of, in paper electrochromatography with electrodes on paper, 9: 1221(J)

metabolic rate in bacteria of, studied by C^{14}, 9: 7662(J)

Lactones

reduction of, by sodium amalgam, 9: 3117

La Dron Mountains (N. Mex.)

mineral determinations in U deposits and prospects in, 9: 5948(R)

Laguna Area (N. Mex.)
mineral determinations in U deposits and prospects in, 9: 5948(R)
mineralogy, 9: 1829
Lanthanum
absorption on clay as simulants for nuclear detonations in harbors, 9: 658
chromatographic separation from Dy, 9: 6906(J)
1:1 compounds with Bi, preparation and crystal structure, 9: 5620(J)
1:1 compounds with P, preparation and crystal structure, 9: 5619(J)
determination by Cu-spark spectroscopy, 9: 885(J)
metabolism and tissue distribution, tracer study, 9: 6176(J)
polarographic studies, 9: 5602(J)
spallation by 480-Mev protons, yields, 9: 7939(J)
spectrographic determination of, in ores and rocks, 9: 162
tissue distribution of, in rats, tracer study, 9: 3730(R)
Lanthanum chelates
with 8-quinolinol, precipitation of, 9: 83(J)
Lanthanum complexes
with cupferron, pyrolysis, 9: 5920(J)
with ethylenediaminetetraacetic acid, physical properties, 9: 6617(J)
Lanthanum compounds
with cyclopentadiene, 9: 3096(J)
hydroxyfluoberyllates, preparation and properties, 9: 5900(J)
preparation and structure of arsenides and antimonides, 9: 5293(J)
toxicity, 9: 845(J)
Lanthanum–copper alloys
crystal structure, 9: 683(J)
Lanthanum hydrides
crystal structure and physical properties, 9: 4636(J)
Lanthanum ions
activity measurements in $LaCl_3$ solutions with resin membrane electrodes, 9: 2150(J)
distribution of, between melts and solid phases, 9: 6554(R)
Lanthanum isotopes La^{139}
half life of the 163-kev excited state, 9: 7112(J)
nuclear magnetic moments, 9: 4278(J)
nuclear quadrupole moment, 9: 5480(J)
Lanthanum isotopes La^{140}
decay scheme, 9: 6047(J)
gamma spectra, 9: 4333
half life, 9: 467(J)
half life and decay, 9: 7187(J)
K-shell internal conversion coefficients and multipolarity assignments, 9: 5535(J)
Lanthanum–magnesium alloys
crystal structure, 9: 683(J)
Lanthanum–nickel alloys
crystal structure, 9: 683(J)
Lanthanum nitrates
preparation of anhydrous, by reaction of oxides and NO_2, 9: 112(J)
Lanthanum nitrides
preparation and structure, 9: 5292(J)
Lanthanum oxide–thorium oxide systems
lattice disorder and electrical resistance in, 9: 7396(J)
Lanthanum oxide–uranium oxide systems
crystal structure and physical properties, 9: 7318(J)
Lanthanum oxide–zirconium oxide systems
heat treatment, phase studies and thermal expansion, 9: 3141(J)
Lanthanum oxides
rapid extraction from rare earths with nitric acid and NH_3 gas, 9: 902(J)
Lanthanum oxychlorides
phosphors, activated with Bi, Sb, and Sm, spectra of, 9: 2670(J)
Lanthanum–zinc alloys
crystal structure, 9: 683(J)
Larvae
labeled with P^{32}, as host for developing Habrobracon, effects on offspring, 9: 5225(J)
of toads, effects of x radiation, 9: 6576(J), 6577(J)
Las Vegas District (N. Mex.)
exploration of, U distribution, 9: 955(J)
La Ventana Area (N. Mex.)
uranium bearing coal and carbonaceous shale in, 9: 2263
La Ventana Mesa (N. Mex.)
uranium distribution, 9: 2709
Leach solutions
(See Uranium leach solutions.)
Leaching
(See also appropriate subheadings under materials leached; see Uranium leach solutions.)
ammonium carbonate pressure, equipment for, 9: 5297(R)
equipment for, U minerals under high temperature and pressure, 9: 6226
review, 9: 3162(J)

L

Lead
absorption of cosmic μ mesons, 9: 721
adsorption on sphalerite, 9: 3111(R), 4980
alpha scattering, 9: 7903
angular distribution, cross sections, and γ rays excited by scattered neutrons, 9: 3993(R)
bremsstrahlung in, electron cross sections for, 9: 6046(J)
chemical polishing, 9: 7990(P)
chromatographic determination of, in soil samples, 9: 3404(J)
corrosion by hydraulic fluids, 9: 2795(R)
corrosion characteristics, 9: 2253(J)
corrosion testing, methods for cleaning exposed specimens for, 9: 952(J)
cosmic ray absorption in, at varying altitude, 9: 670(J)
cosmic shower production in, 9: 2614(J)
cosmic showers under, production, 9: 4489
coulometric and polarographic determination of trace amount of, 9: 1205(J)
cross sections for neutron transmission and multiplication, 9: 3646(J)
detection of inclusions of, in Al by colorimetric spot tests, 9: 1196
differential neutron elastic scattering cross sections at 4.1 Mev, 9: 4597(J)
diffusion in AgBr, 9: 1189(J)
elastic scattering of 22-Mev α particles from, 9: 2937(J)
elastic scattering of 40-Mev α particles from, 9: 7132(J)
electric properties of, for nuclear batteries, 9: 266
electroforming from fluoborate baths, 9: 3495
electron emission from, bombarded by hydrogen ions, 9: 250(J)
energy loss of secondary electrons in a cavity with walls of, 9: 2045(J)
excretion of, effects of Ca EDTA on treatment of, 9: 1730
external bremsstrahlung emitted from P^{32} β rays stopped in, 9: 2505(J)
fast neutron scattering by, 9: 3309(J)
fission by slow π^- mesons, 9: 6738(J)

Lead (cont'd)
galling and seizing of, by friction coefficients, 9: 1269
gamma attenuation, 9: 1656, 2983
gamma penetration, tables and graphs, 9: 2472
gamma ray yields from Coulomb excitation, 9: 6052(J)
gamma scattering by nuclear electric field, 9: 4610(J)
gamma scattering cross section in, 9: 6043(J)
gamma spectrum after thermal neutron capture, 9: 7907(J)
mean free path of heavy cosmic ray primaries, 9: 1296(J)
μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)
multiple scattering of slow neutrons by, 9: 5805(J)
neutron absorption and total cross sections at 1.4 Bev, 9: 5486(J)
neutron-diffraction studies of superconducting state, 9: 3218(J)
neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)
neutron polarization by scattering from, 9: 2042(J)
neutron reactions (n,π^0) at 400 Mev, cross section, 9: 5742(J), 6011(J)
neutron reactions (n,mγ) at 4.5 Mev, γ rays from, 9: 4589(J)
neutron scattering cross section from 12.9 to 16.2 mev, 9: 6042(J)
neutron total cross sections, 9: 7124(J)
nuclear magnetic moments, 9: 2895
photon reactions (γ,n), 250 Mev, 9: 6772(J)
photon scattering cross section, 9: 4205(R)
photoneutron yield, measurement with NaI crystal, 9: 3944(J)
photonuclear reactions, 9: 2449(J)
plastic deformation and stress, 9: 7822
polarographic determination of, in Be, 9: 5273(J)
polishing of, with alumina abrasives, technique, 9: 3879(J)
polonium diffusivity into, 9: 6257(J)
proton attenuation cross sections at 860 Mev, 9: 7172(J)
proton range in, 1- to 7-Mev, 9: 6788(J)
proton stopping cross section, 9: 2026
purification, flowsheet for, 9: 3111(R)
quantitative determination of divalent, using a high-frequency oscillator and ethylenediaminetetraacetic acid, 9: 2169(J)
radiometric determination, 9: 2634
range of cosmic protons in, 9: 1922
scattering and absorption of 50-Mev π^+ mesons in, cross sections, 9: 2929
scattering of fast neutrons by, angular distribution, 9: 5522(J)
scattering of sea level cosmic shower secondaries, momentum spectrum, 9: 7413(J)
as shielding for burned-out reactor fuel elements, calculations, 9: 2984
shot, permeability and porosity to fluid flow, 9: 5937
slowing down of polarized protons by, 9: 2039
solubility of, in molten $PbCl_2$, 9: 3052
spectra, isotope shift in, 9: 1415(J)
spectrographic determination in Bi, 9: 1475
spectrographic determination of, in ores and rocks, 9: 162
three-quantum annihilation of positrons in, 9: 249(J)
transition probabilities, dipole and quadrupole, 9: 7917(J)

Lead (liquid)
diffusion and self-diffusion of Be(liquid) in, 9: 179
diffusion in molten Bi–Pb alloys, 9: 179

Lead alloys
corrosion testing, methods for cleaning exposed specimens for, 9: 952(J)
spectrophotometric determination of Bi in, containing Sb, Sn, Cu, As, Ni, and Fe using Na diethyldithiocarbamate, 9: 2172(J)

Lead–antimony alloys
linear expansion, density, electric resistivity, and thermoelectric properties, 9: 7359(J)

Lead–bismuth alloys
segregation of impurity Po to grain boundaries, 9: 3186(J)

Lead–bismuth alloys (liquid)
diffusion of Bi in, 9: 5669(J)
diffusion of Pb and Bi in, tracer techniques, 9: 179

Lead–bismuth–tin alloys
corrosive effects on metals at high temperatures, 9: 6659

Lead–boron systems
volumetric determination of B in, 9: 6868

Lead chloride–lithium chloride systems
thermodynamic properties, 9: 7094(J)

Lead chloride–potassium chloride systems
thermodynamic properties, 9: 7094(J)

Lead chloride–potassium chloride systems (liquid)
electric conductivity, 9: 2139(J)

Lead chloride–rubidium chloride systems
thermodynamic properties, 9: 7094(J)

Lead chloride–sodium chloride systems
thermodynamic properties, 9: 7094(J)

Lead chlorides
thermodynamic properties of, in solutions with alkali metals, 9: 7094(J)

Lead chlorides (liquid)
solubility of Pb in, 9: 3052
transport numbers in, measurement, 9: 1219(J)

Lead compounds
hydroxyfluoberyllates, preparation and properties, 9: 5900(J)
polarographic behavior of, in molten ammonium formate, 9: 7292

Lead fluoride crystals
growth of from the melt, 9: 3414(J)

Lead fluorides
crystal structure and optical properties, 9: 3414(J)

Lead(II) ions
adsorption of, from hydrochloric acid, nitric acid, and ammonium nitrate solutions with a strong base quaternary amine anion-exchange resin, 9: 1226(J)

Lead isotopes
compositions in stone meteorites, 9: 4445(J)
decay schemes of neutron-deficient, 9: 3689(J), 3690(J)
distribution and origin in ores and rocks, 9: 7776(J)
electromagnetic separation, 9: 1592
isomeric levels and transitions of neutron-deficient, 9: 3688(J)

Lead isotopes Pb^{201}
metastable states, 9: 7128(J)

Lead isotopes Pb^{202}
formation, decay properties, and half life, 9: 364(J)

Lead isotopes Pb^{203}
decay schemes, 9: 7272(R)
metastable states, 9: 7128(J)

Lead isotopes Pb^{204}
decay schemes, 9: 7272(R)
energy levels, 9: 2963(J)
energy levels, gyromagnetic ratio, nuclear magnetic moment, and angular correlation of Pb^{204m}, 9: 3278(J)
nuclear magnetic moment, 9: 988(R)

Lead isotopes Pb^{205}
formation, decay properties, and half life, 9: 364(J)

Lead isotopes Pb^{206}
deuteron reactions (d,p) at 15 Mev, proton energy spectra from, 9: 4574(J)

Lead isotopes Pb^{206} (cont'd)
proton reactions (p,n), cross sections, 9: 7386
ratio of, to Pb^{207} in earth and meteorites in calculations of age of earth, 9: 1835
x-ray spectrum of, explanation of, 9: 6525(J)
Lead isotopes Pb^{207}
angular correlations, 9: 1067(R)
deuteron reactions (d,p), proton angular distributions from, 9: 762(J)
deuteron reactions (d,p) at 15 Mev, proton energy spectra from, 9: 4574(J)
fission cross sections for 380-Mev neutrons, 9: 5156(J), 5778(J)
neutron excitation of 0.8-sec metastable state of, cross section for, 9: 3678(J)
ratio of, to Pb^{206} in earth and meteorites in calculations of age of earth, 9: 1835
Lead isotopes Pb^{208}
bremsstrahlung reactions (γ,p) at 23 Mev, yield and angular distribution, 9: 4572(J)
deuteron elastic scattering cross section at 15.2 Mev, 9: 7561(J)
deuteron reactions (d,p) at 15 Mev, proton energy spectra from, 9: 4574(J)
energy levels, 9: 6057(J)
Lead isotopes Pb^{209}
deuteron elastic scattering cross section at 15.2 Mev, 9: 7561(J)
radioactivity, 9: 2500
Lead isotopes Pb^{210}
beta decay lifetime of 46.5-kev excited state following, 9: 6799(J)
half life, 9: 3693(J)
Lead isotopes Pb^{212}
half life, 9: 2962(J)
K Auger lines from, energy and intensity of, 9: 6539(J)
milligram radium equivalent of, 9: 1342(J)
Lead isotopes Pb^{214}
internal conversion spectrum of, widths of lines of, 9: 6464(J)
Lead–lithium alloys
crystal structures of Li_3Pb and Li_7Pb_2, 9: 6665
Lead–magnesium alloys
corrosion properties and electrode potentials of, in various media, 9: 4143(J)
Lead oxides
electrical properties of, for nuclear batteries, 9: 267(R)
heat and free energy of formation, 9: 529(J)
Lead–polonium alloys
preparation and crystal structure of PbPo, 9: 5625
Lead sulfates
surface area determinations of, by ion exchange, 9: 4370(J)
Lead sulfides
adsorption by electrochemical studies of, 9: 3111(R)
electrochemical studies of adsorption on, 9: 4980
Lead titanates
compacted with Sr titanates, dielectric and thermal properties and lattice dimensions of, 9: 2704(J)
dielectric and thermal properties and lattice constants of, containing Sn^{4+} ions, 9: 2705(J)
x-ray and neutron-diffraction study of, 9: 3238(J)
Lead–titanium alloys
preparation and phase studies, 9: 1872(J)
Leak detectors
for arcton in air, calibration of, 9: 6373
design, 9: 1428(P), 7055
for high-vacuum systems, design, 9: 4841
hydrogen Pirani, using a charcoal trap, design, 9: 4233(J)
Leak detectors (cont'd)
performance, for detecting Na leaks in vertical piping, 9: 605
use of halogen effect for sensitive, 9: 3454(J)
Leaks
(See also as subheading under specific plants and equipment; for variable leaks, see Valves.)
contamination by radioactive, 9: 6678(R)
Leaves
of strawberries, uptake of Ca and P, tracer study, 9: 3751
Lectures
on uses of radioisotopes in clinic and research, 9: 6168(J)
Lehigh Univ., Bethlehem, Penna.
progress reports on non-soap lubricating greases, 9: 6882(R)
Lemhi Pass District (Idaho-Mont.)
exploration for U and Th deposits in, 9: 1520(J)
Lepidine
chemical reactions, 9: 5884(J)
Leptons
produced by spin-zero meson decay, 9: 6022(J)
Leucine
metabolism of, in Co^{60}-irradiated mice, 9: 61(R)
Leukemia
case history of, in a patient with thyroid carcinoma treated with I^{131} and x radiation, 9: 3019(J)
chronic, comparison of results of total-body spray x irradiation and P^{32} internal irradiation, 9: 3037(J)
chronic lymphatic, effects on liver blood flow, tracer study, 9: 2609
glycolytic rate in leukocytes, effects of enzymes on, 9: 6
incidence of, among atomic bomb survivors in Hiroshima, 9: 2586(J)
radioinduced, in mice, 9: 4047(J)
transfer of, in mice, factors affecting, 9: 3748(R)
Leukocytes
adhesiveness of, effects of total-body irradiation on, in dogs and guinea pigs, 9: 5228(J)
isolation of, technique, 9: 4344
migration, effects of x irradiation on, in rats and rabbits, 9: 2577(J)
normal and leukemic, glycolytic rate in, effects of enzymes on, 9: 6
phagocytic indices, effects of x irradiation on, in rats, 9: 2578(J)
protective effects of granulocytes in radiation injury, 9: 1720
relationship between granulocyte count and survival following midlethal irradiation in mice, 9: 39(J)
Leukopenia
radioinduced, recovery from, 9: 1720
radioinduced, treatment with alkoxyglycerols, 9: 1455(J)
Level indicators
design, 9: 4039(R)
design and performance of, for liquid metal systems, 9: 6999(R)
hermetically sealed high-temperature, 9: 7058
liquid, for He, H_2, and N_2, 9: 5077
for liquid metals, design, 9: 4231
for liquid metals, gamma radiation technique for, 9: 5990
for liquid Na in stainless steel tubes, design, 9: 7438(J)
remote control, using neutrons, design, 9: 4400(J)
Light
dispersion, reflection, and diffraction in crystals, theory, 9: 7420(J)
emission, duration, and quenching of, in phosphors, 9: 7494(R)
interaction with non-conducting crystals and electrons in solids, quantum theory of, 9: 6553(J)
measurement of time varying absorption of, 9: 2348(J)

Light (cont'd)
random, in optical instruments, 9: 6380(J)
scattering functions for spherical colloidal particles, tables, 9: 4299
scattering of low-energy photons by particles of spin ½, 9: 1399(J)
scattering of very low-frequency, by systems of spin ½, 9: 1398(J)

Light sources
isotopic standard wave length, review, 9: 6717(J)

Light spectra
of the glow from radioactive sources, 9: 7184

Lignite deposits (Idaho)
occurrence and U distribution in, 9: 2263

Lignite deposits (S. Dak.)
exploration in Mendenhall Strip Mine, 9: 622(R)
geochemistry, mineralogy, and U occurrence, 9: 5002(J)
occurrence and U distribution in, 9: 2263
occurrence in Harding Co., 9: 7758

Lignite deposits (U.S.)
occurrence of U bearing, 9: 5326(R)

Lignites
analysis, mineralogy, and petrology, 9: 3462(R)
analysis of, from Mendenhall Strip Mine, Harding Co., S. Dak., 9: 5002(J)
analysis and mineralogy of U-bearing, 9: 622(R)
analysis and petrology of U-bearing, 9: 1511(R), 1827(R)

Limestone
(See also Calcium carbonates.)
alpha radioactivity in, 9: 445(J)
carbon (C^{13}) abundance, 9: 6276(J)
coral, radiometric analysis of, for Th^{230}, 9: 1762
thermoluminescence of, 9: 4995

Limestone deposits (U.S.)
occurrence of U bearing, 9: 5326(R)

Limestone deposits (Wyo.)
occurrence of U mineralization in, 9: 956(J)

Line recorders
(Recording mass spectrometer; see also Mass Spectrometers.)
design of high-speed pen, and amplifier, 9: 270

Linear accelerators
(See also Cockcroft-Walton accelerators; Van de Graaff accelerators.)
beam focusing, theory, 9: 397(J)
cavity resonator analysis for proton, 9: 3987
cost factors and design of high-energy electron, 9: 772
debuncher to reduce energy spread of particle beam, analysis, 9: 7164
design, predicted and observed performance of a billion-volt, 9: 5165
design and contruction of, for medical research, 9: 4882(J)
design and operation of 50-Mev microwave, 9: 2025(J)
design of Stanford Mark III electron accelerator, 9: 3308(J)
electrical properties of helical accelerator tubes, 9: 1372(J)
electron, design and performance of 15-Mev, for medical research, 9: 4881(J)
electron orbits in, calculation, 9: 3660
electron traveling-wave, for radiation processing, 9: 1369(J)
fabrication of TiO_2 wave guides for, 9: 1096
focusing, 9: 2465
focusing lenses of, alternating gradient and solenoid, effects of misalignment of, 9: 6493
focusing system for 600-Mev protons, 9: 1097

Linear accelerators (cont'd)
ion beam stabilization of Alvarez, 9: 4880(J)
optical alignment, 9: 4878
phase oscillations in, analysis, 9: 3988
proton, development and design, 9: 6781(J)
proton dynamics, 9: 5161
proton sources (high current) for, 9: 7160
results from 1-Mev machine at Lyon, France, 9: 1374(J)
shunt impedance of helical accelerator tubes for, 9: 1373(J)
strong focusing for fast heavy particles, 9: 2024(J)
traveling-wave tube type, for medical use, 9: 1102(J)
for use in radiotherapy, design of 8-Mev, 9: 4684(J)
wave guide for, of 50-Mev protons, 9: 6499(J)

Lipids
(See also Fatty acids; Phosphatides; Sterols.)
effects of radiation on, review of literature, 9: 2549
effects of whole-body irradiation on tissue distribution of, in liver, spleen, and kidney in rats, 9: 1161(J)
levels in blood plasma, effects of irradiation on, in rabbits, 9: 25(J)
metabolism of, in rat liver, tracer study, 9: 2099(R)
of rat livers, effect of irradiation on synthesis of, 9: 5852(J)

Lipoproteins
of blood serum, chromatographic analysis, 9: 3071
hydrolysis of, effects of heparin-activated enzyme systems, 9: 2540
metabolism, effects of massive doses of x radiation on, in dogs, 9: 5573
metabolism, relationship to coronary disease, 9: 3730(R)
metabolism of, effects of radiation on, in rabbits, dogs, rats, and mice, 9: 3009
metabolism of, effects of total-body x irradiation on, in rabbits, 9: 1446
metabolism of, in normal and irradiated rabbits, 9: 5839
spectrophotometric determination of, in blood serum, 9: 3778

Liquation
equilibrium diagrams established by, and application to the Al–Fe–Si diagram, 9: 6323(J)

Liquid baths
design, development, and instrumentation of, for high-temperature studies of lubricants, 9: 4981
design of isothermal, for use in range 200 to 500°C, 9: 4096(J)
electroforming of funnels, tubes, and trumpets of various metals from fluoborate, cyanide, sulfate–chloride, Unichrome Cr-110, and chromic acid, 9: 3495
mass transfer in, with aid of radioactive isotopes, investigation of, 9: 7799(J)

Liquid flow
(See also Compressible flow; Convection; Gas flow; Incompressible flow; Subsonic flow; Supersonic flow; Transonic flow.)
non-Newtonian, pressure losses in pipes, 9: 4769
pressure drop characteristics through a perforated-plate assembly, 9: 4771
stability of plane convective, 9: 3813(J)

Liquid jets
vibrating, with variable surface tension, theory, 9: 3444

Liquid Metal Fuel Reactor
removal of xenon, 9: 6177

Liquid metals
(See Metals (liquid).)

Liquid metals conferences
proceedings of, held at Abingdon, May 16, 1953, 9: 3443

Liquid metals conferences (cont'd)
summary of unclassified papers presented at meeting at General Electric Lab., October 8, 1952, 9: 4171

Liquids
air bubbles in, motion, 9: 6244
degasification of, equipment, 9: 2195
gas chromatographic separation and analysis of volatile, 9: 2672(J)
density gradients in, production of, by mechanical means, 9: 7847(J)
nuclear magnetic resonance, 9: 5769(J)
nuclear magnetic resonance in, analysis of spin-spin multiplets, 9: 5471(J)
nuclear magnetic resonance in, under high pressure, 9: 2011(J)
optimum free-volume theory of, 9: 235
overheated, under positive pressure, nucleation of vapor bubbles in, under ion bombardment, 9: 2663(J)
physical and physico-chemical properties of, influence on hydrodynamics, review of book, 9: 2231(J)
proton relaxation times, 9: 5143(J)
radioactivation apparatus using Rn^{222}, 9: 687(J)
self-diffusion in, mechanism of, 9: 5384(J)
solubility of gases in, instrument for, 9: 3068
solubility of solids in nonpolar, effects of pressure on, 9: 4718(J)
thermal conductivity of viscous, 9: 2336(J)
thermal diffusion and molecular motion in, 9: 4717(J)
thermal diffusion in, theory, 9: 2797(J)
thermal relaxation time of, nuclear inductor for measurement of, 9: 286(J)
trapping of splashes from boiling, design of apparatus for, 9: 1779
x-ray-diffraction chamber for study of, at temperatures up to 1600°C, 9: 7435

Lisbon Anticline (Utah)
occurrence of unoxidized U deposits in, mineralogy of, 9: 5948(R)

Lisbon Valley Area (Utah)
geology and U distribution, 9: 5049(J)

Lithium
abundance in primary cosmic rays, 9: 1299(J)
asymmetry in p-n and p-p scattering from, with 285-Mev polarized protons, 9: 7174(J)
backscattering from, bombarded by 1-Mev electrons, 9: 2041(J)
chemical reactions with boron halides, 9: 7266(R)
chemical separation and absorptiometric determination of small amounts of, 9: 537(J)
cosmic showers under, production, 9: 4489
deuteron reactions in, angular distributions, 9: 3649(J)
diffusion of Ag into neutron-irradiated, 9: 7797(J)
electron reactions (e,π^+) at 500 Mev, 9: 4545(J)
excitation energies of Li_2 molecule, calculation, 9: 344
heat of fusion, 9: 172
ion exchange separation from Ca and Mg and titrimetric determination of, 9: 1200(J)
isotopic analysis of, by neutron activation, 9: 541(J)
π-mesonic x-ray K lines of, 9: 671(J)
neutron absorption cross sections, 9: 5762
neutron irradiation effects on lattice, 9: 7797(J)
neutron-proton coincidences from γ bombardment, 9: 1066(R)
oxidation at 0 to 760 mm pressure and at 25 to 900°C, 9: 6182(R)
photon reactions (γ,n) at 250 Mev, 9: 6772(J)
preparation of small amounts of, by electrolysis, 9: 921(J)
properties and reactor applications, 9: 6476
proton-proton coincidences in, produced by 340-Mev γ rays, 9: 7556(J)
proton total cross sections at 208 and 315 Mev, 9: 358(J)

Lithium (cont'd)
reaction with $BF_3 \cdot NH_3$, 9: 515
reaction with H_2 between 29 and 250°C, 9: 5589
reactions of 125-Mev deuterons with, analysis of disintegration products from, 9: 1644
specific heat of, 9: 237(J)
spectrophotometric determination of small amounts in air, 9: 4941
surface energies and temperature coefficients, 9: 6669(J)
thermal expansion, 77 to 300°K, 9: 727(J)
thermodynamic properties, 9: 7282(J)
three-quantum annihilation of positrons in, 9: 249(J)
tritium production from, by deuteron bombardment, 9: 2920(J)
volumetric determination, 9: 5258

Lithium (liquid)
thermal conductivity, measurement, 9: 2780(J)

Lithium alloys
properties and reactor applications, 9: 6476

Lithium aluminum hydrides
purification and separation from AlH_3 and $AlCl_3$, 9: 7263
reaction with dimethyl Be to form methyl Be hydride, 9: 1740

Lithium–aluminum–magnesium alloys
magnesium-rich corner of 100, 200, 375°C isothermal sections of, 9: 2760(J)
phase relations in, 9: 3166, 3481, 3484(R)

Lithium aluminum silicates
thermal fracture under quasi-static thermal stresses, 9: 1506(J)

Lithium antimonides
heat of formation of, 9: 1186(J)

Lithium borates
coloration, 9: 4314(J)
preparation of hydrided, 9: 4089(J)

Lithium borohydrides
hydrolysis, 9: 4065(J)
ion characteristics, determination of, 9: 2141(J)
reaction with B^{10}-enriched boron trifluoride etherate, 9: 3055
specific conductance and chemical reactions with C_2H_5MgBr in $(C_2H_5)_2O$, 9: 6871
toxicity, 9: 4054

Lithium bromides
exchange reactions with isopropyl bromide and tert-butyl bromide in acetone, 9: 5593(J)

Lithium chloride–aluminum chloride systems
electric conductivity, 9: 2613

Lithium chloride–calcium chloride–potassium chloride systems
phase studies, 9: 4059

Lithium chloride–lead chloride systems
thermodynamic properties, 9: 7094(J)

Lithium chloride–magnesium chloride systems
thermodynamic properties, 9: 7108(J)

Lithium chloride–potassium chloride–potassium fluoborate systems (liquid)
electrolysis of, in temperature range 350 to 550°C, 9: 52

Lithium chlorides
absorption spectra of irradiated, 9: 6868
solutions, ion exchange from, 9: 3103(J)
thermodynamic properties of $MgCl_2$ in fused, 9: 3768(J)

Lithium compounds
organo-, high-temperature properties, 9: 4421

Lithium compounds (cont'd)
organo-, synthesis, 9: 4091(R), 4421
preparation, specific conductances, and chemical reactions of alkyl lithium compounds, 9: 6871
Lithium deposits
occurrence in North America, 9: 7765(J)
Lithium deuterides
molecular properties and x-ray scattering, 9: 3407
Lithium fluoride–calcium fluoride–magnesium fluoride systems
phase studies, 9: 7707
Lithium fluoride–calcium fluoride systems
phase studies, 9: 7708
Lithium fluoride complexes
proton stopping cross sections in LiF, 9: 6100(J)
Lithium fluoride crystals
annealing process in neutron-irradiated, 9: 6797(J)
color-center magnetic resonance of x-ray and proton bombarded, 9: 1119(J)
color centers in x-irradiated, production and bleaching of, 9: 801(J)
effects of neutrons on x-ray lattice parameters and density, 9: 1668(J)
electron distribution in, radiographic determination of, 9: 4391(J)
expansion and coloration from x- or deuteron irradiation, 9: 5811(J)
fluorescence and thermoluminescence in x-irradiated, 9: 3682(J)
measurement of cyclotron beam energies with, 9: 5786(J)
radiation and annealing, 9: 5382(R)
thermoluminescence of, 9: 4995
x-ray measurements of pile-irradiated, 9: 2947(J)
Lithium fluoride–potassium fluoride–sodium fluoride systems
thermal capacity and enthalpy, 9: 634(R)
Lithium fluorides
absorption spectra of irradiated, 9: 6868
specific heat, 9: 6212(J)
spectra of Li^7F^{19}, by electric resonance molecular beam spectroscopy, 9: 5752(J)
spin-rotation coefficient of fluorine in, 9: 7900(J)
thermoluminescence, 9: 2412(R)
unit cell dimensions of, made from Li^6 and Li^7, 9: 2374(J)
Lithium hydrides
interactions between states of, 9: 6546(R)
molecular properties and x-ray scattering, 9: 3407
preparation by reaction between Li and H_2 between 29 and 250°C, 9: 5589
properties for shielding purposes, 9: 7957
Lithium hydroxides
enthalpy and entropy of, to 900°K, 9: 2152(J)
heat of fusion of, at 744.3°K, 9: 2152(J)
Raman spectra of $LiOH \cdot H_2O$ and, at room temperature, 9: 3434
Lithium iodide crystals
gamma response, 9: 1067(R)
Lithium iodides
crystal growing and phosphor properties of activated and non-activated, 9: 3947(J)
mass spectrum, heat of dissociation, heat of sublimation, and lattice energies, 9: 2840
Lithium ion beams
electron loss by 80- to 250-kev, effective diameter, 9: 7564(J)
Lithium ions
application to particle microscopy, 9: 1950(J)
conductometric determination of, in paper chromatograms, design and performance of apparatus for, 9: 2215(J)
Lithium ions (cont'd)
effect on electrodeposition of Cu, 9: 1195(J)
ground state energy, 9: 5751(J)
Lithium isotopes
decay and nuclear properties, 9: 3624(J)
mass ratios of, determined from microwave spectra of alkali halides, 9: 811(J)
spectrographic analysis using photoelectric techniques, 9: 4640(J)
Lithium isotopes Li^6
binding energy and energy levels, 9: 3635(J)
effects on unit-cell dimensions of LiF, 9: 2374(J)
energy levels from deuteron-He scattering, 9: 4592(J)
energy of ground state, 9: 2442(J)
enrichment by electrolytic conversion, 9: 6391(J)
gamma reactions (γ,d) of, cross sections and nuclear properties of system, 9: 380(J)
intermediate coupling model applied to structure of, 9: 7119(J)
mass difference of He^6 and, 9: 763(J)
natural abundance ratio to Li^7, 9: 1029(J)
neutron activation determination, 9: 541(J)
neutron reactions (n,t) and simple model of nucleus of, 9: 3298(J)
neutron resonance from deuteron-He scattering, 9: 4591(J)
neutron total cross sections, 9: 1067(R)
nuclear magnetic moment of, calculated by proton-neutron coupling, 9: 742(J)
nuclear potentials of, meson theory applied to, 9: 5824(J)
proton reactions (p,α) and neutron reactions (n,α), Coulomb effect in, 9: 5159(J)
proton reactions (p,γ), 9: 3648(J)
spectrographic determination of ratio of Li^7 to, 9: 1760(J)
thermonuclear reactions of protons with, in stars, 9: 3647(J)
triton reactions, 9: 5154(J)
triton reactions(t,d) and (t,p), Q values of, 9: 763(J)
Lithium isotopes Li^7
charged particle emission from triply charged He^3 bombardment, 9: 1364(J)
deuteron reactions (d,d), 9: 1066(R)
deuteron reactions (d,n), 9: 4876(J), 5160(J)
deuteron reactions (d,n), energy levels of Be^8 from, 9: 4575(J)
deuteron reactions (d,n), energy spectrum from, 9: 6442(J)
deuteron reactions (d,p), 9: 5154(J)
effects on unit-cell dimensions of LiF, 9: 2374(J)
energy levels, 9: 6080(J), 6760(J)
gamma reactions (γ,α) and energy levels, 9: 1095(J), 1116(J)
gamma reactions (γ,n), 9: 6488(J)
gamma reactions (γ,t), excitation function for, 9: 3983(J)
inelastic neutron scattering in, 9: 3320(J)
inelastic scattering of α particles from, study of 478-kev excited state by observing γ ray from, 9: 420(J)
ionization of A, CO_2, and N_2, 9: 4266(R)
natural abundance ratio to Li^6, 9: 1029(J)
spectra of Li^7F^{19}, by electric resonance molecular beam spectroscopy, 9: 5752(J)
nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)
proton and deuteron reactions (p,n) and (d,n), 9: 1067(R)
proton reactions (p,n), resonances in, 9: 765(J)
proton reactions (p,n), studied by time-of-flight techniques, 9: 376
proton reactions (p,n), yield of neutrons from, for proton energies of 2.5 and 2.9 Mev, 9: 4877(J)
spectrographic determination of ratio of Li^6 to, 9: 1760

Lithium isotopes Li^7 (cont'd)
thermonuclear reactions of protons with, in stars, 9: 3647(J)
triton reactions (t,α), angular distribution of, 9: 385(J)
triton reactions (t,α), Q value of, 9: 763(J)
Lithium isotopes Li^8
alpha spectra in β–α decay of, from 1 to 6.5 Mev, 9: 6120(J)
beta decay, angular correlation with Be^8 α particles, 9: 5819(J)
beta decay, effect of spin-orbit forces, 9: 5158(J)
decay and half lives, 9: 1680(J)
energy levels, 9: 6760(J)
excited states, 9: 5154(J)
half life, 9: 2951
range-energy relations, 9: 408(J)
Lithium–lead alloys
crystal structures of Li_3Pb and Li_7Pb_2, 9: 6665
Lithium–magnesium alloys
constitution diagram of, 9: 2768(J)
marine-atmosphere corrosion, 9: 4441(J)
mechanical properties, rolling, and structure, 9: 4160(R)
ordered structure proposed for Li_3Mg_2, 9: 5693
thermodynamic properties, 9: 2294(R)
Lithium–magnesium–silver alloys
constitution diagram of, 9: 2768(J)
Lithium–magnesium–zinc alloys
phase relations in, 9: 3166
Lithium niobates
crystal structure of $LiNbO_3$, 9: 7301(J)
Lithium oxide–boron oxide–silicon oxide systems
thermal expansion, 9: 1555
Lithium oxide–boron oxide–water systems
phase studies, 9: 4073(J)
Lithium oxides
enthalpy and entropy of, to 1050°K, 9: 2152(J)
vapor pressure, 9: 4716(J)
volatility at high temperatures, experimental investigation, 9: 2156(J)
Lithium perchlorates
diffusion coefficients of, in dilute aqueous solutions at 25°, 9: 4372(J)
Lithium peroxides
preparation and properties, 9: 7284(J)
Lithium, phenyl-
chemical reactions with perfluorinated acids and their esters in ether, 9: 5928(J)
chemical reactions with trihaloacetic acids in ether, 9: 5927(J)
Lithium–silver alloys
constitution diagrams, casting, and crystal structure, 9: 2767(J)
Lithium–sodium alloys (liquid)
activity coefficients and phase studies, 9: 172
Lithium sulfates
ferrous sulfate–lithium sulfate systems, effects of radiation on, 9: 6106(J)
Lithium tantalates
crystal structure of $LiTaO_3$, 9: 7301(J)
Lithium titanates
heat capacities and entropies at 298.16°K, 9: 4374(J)
LITR
(See Materials Testing Reactor Mockup.)
Litters
relationship between, and survival following mid-lethal irradiation in mice, 9: 39(J)
Little Doe Claim (Ariz.)
exploration of, 9: 161
Liver
accumulation of β activity from injected P^{32} in, effects of dose size on, 9: 1717(J)
blood circulation in rat, tracer study, 9: 5246
blood flow in, effects of adrenaline, diet, and leukemia on, tracer study, 9: 2609
concentrations of oxidized and reduced diphosphopyridine nucleotide in, effects of total-body x irradiation on, in rats, 9: 3740(J)
effects of γ radiation on, of white rats, 9: 834(J)
enzyme systems, effects of total-body x irradiation on, in rats, 9: 2120(J)
function test, employing radioactive Rose Bengal, 9: 1462
function tests for laboratory animals, 9: 4911(R)
glycogen levels in, effects of whole-body irradiation on, in rats, 9: 7611
mass, effects of total-body x irradiation on, in rats, 9: 1447
metabolism of desoxyribonucleic acid in, effects of irradiation on, in rats, tracer study, 9: 4918(J)
metabolism of fatty acids in, effects of pantothenic acid on, in rats, tracer study, 9: 5304
protein synthesis in, effects of whole-body irradiation on in rats, tracer study, 9: 7234
radioinduced cirrhosis, changes in electrophoretic patterns in plasma and ascitic fluid associated with, in dogs, 9: 829(J)
rats, glycogen and lipids of, effect of irradiation on incorporation of C^{14}, 9: 5852(J)
Liver diseases
cirrhosis, effects of low-protein diet on development of, in irradiated rats, 9: 2569(J)
effects of, on uptake of I^{131} by thyroid, 9: 499(J)
radiodiagnosis, 9: 1462
Lodgepole Area (S. Dak.)
uranium distribution in, 9: 2263
Long Area (Alaska)
uranium distribution in, 9: 1523(J)
Long John Claim (Colo.)
uranium and V distribution, 9: 1513
Long Lease Mine (Nev.)
geology and U occurrence, 9: 6963
Lopo
(See Los Alamos Water Boiler.)
Los Alamos Scientific Lab., N. Mex.
manual of analytical procedures for industrial hygiene, 9: 6605
radiation monitoring handbook, 9: 3928
Los Alamos Water Boiler
heat transfer in, effect of radiolytic-gas bubbling, 9: 4567(J)
recombination of H_2 and O_2 from, 9: 754(J)
Lovelace Foundation for Medical Education and Research, Albuquerque, N.Mex.
progress reports, 9: 3359, 3360
Low Intensity Training Reactor
(See Materials Testing Reactor Mockup.)
Lubricants
(See also Greases; Oils.)
bibliography on, 9: 1817
corrosive effects, hydrolysis, lubricity, oxidation, and properties, 9: 5934(R)
corrosive effects, oxidation, and properties of, 9: 2795(R), 3123(R), 6949(R)

Lubricants (cont'd)
corrosive effects on ferrous and non-ferrous metals, measurement of, by radioisotopes, 9: 7742(J)
development of gear and spline lubricant tester, 9: 1817
effect on extrusion pressure, 9: 6292
effectiveness of, for Hf, Zr, and Ti, 9: 961(R)
evaluation of, for Ti and Ti alloys, 9: 4466(J)
halogen-substituted methane and ethane gases as steel, 9: 4979
for high-speed anti-friction bearings, use of greases as, 9: 4422
high-temperature, development and properties, 9: 4120(R), 6181(R)
high-temperature, thermal decomposition, 9: 3805(R)
mist cooling in machine tool practice, health hazards, 9: 2723
organic compounds for high-temperature, viscous properties, 9: 5681(R)
oxidation, corrosive effects, and thermal stability, 9: 4484(R)
oxidation by, effects of antioxidant additives, 9: 4115(R), 4419
solid, effectiveness, testing, and crystal structure, 9: 5636
solid, friction and wear testing, 9: 4794
stability, volatility, and viscosity at high temperatures, 9: 1814(R)
synthesis, thermal decomposition, and properties of high-temperature, 9: 517(R)
synthesis and properties of aromatic compounds for, 9: 5626(R)
synthesis and properties of heterocyclic compounds for use as, 9: 5926(R)
synthetic, for aircraft, preparation and properties, 9: 5311
temperature limitation of, for ball bearings, 9: 1813
thermal properties, 9: 4108(R)
thermal properties and corrosive effects, 9: 136(R)
thermal stability, 9: 4421
triaryl esters of phosphoric acid as high-temperature, preparation and properties, 9: 4420
viscosity, effects of γ radiation on, 9: 7722
wear properties, measurement with radioactive isotopes, 9: 7742(J)

Lucky Strike No. 2 Mine (Utah)
occurrence of rabbittites in, 9: 3829(J)

Ludlow Formation (S. Dak.)
geology, lignite deposits, 9: 7758

Lukachukai District (Ariz.)
exploration and geology, 9: 2262(R)
geology, 9: 1828
mineralogy, 9: 1829

Lukachukai Mountains (Ariz.)
mineral determinations in U deposits and prospects in, 9: 5948(R)

Lulu Belle Claims (Ariz.)
exploration, geology, and mineralogy, 9: 5325

Luminescence
(See also Fluorescence; Phosphorescence.)
electro-, theory of, 9: 2343(J)
modulation in nonuniformly excited ZnS phosphors, 9: 7887(J)
in organic phosphors, 9: 864(J)
spectra of polycyclic hydrocarbon crystals, 9: 7300(J)
symposium on solid inorganic phosphors, 9: 1614(J)

Luminescent detectors
design, 9: 4248(J)
design of "luminescence chamber", 9: 2860(J)
performance, 9: 2412(R)
thermo-, design and performance, 9: 1964(R)

Luminescent materials
abstracts of literature on, 9: 3225(J)
symposium on solid inorganic phosphors, 9: 1614(J)

Lungs
deposition and clearance of radioactive dusts from, 9: 5875(J)
deposition and retention of α-emitting aerosols, 9: 4048
deposition of aerosols in, of dogs, 9: 3359

Lutetium
arc spectrum, analysis, 9: 4024(J)
separation from rare earths by ion exchange, 9: 5889(J)
tissue distribution of, in experimental animals, tracer study, 9: 1725(J)

Lutetium chlorides
crystal structure, 9: 544(J)

Lutetium isotopes
energy levels, spacings and neutron widths of, 9: 6045(J)

Lutetium isotopes Lu^{170}
gamma spectra, 9: 7272(R)

Lutetium isotopes Lu^{171}
gamma spectra, 9: 7272(R)

Lutetium isotopes Lu^{172}
gamma spectra, 9: 7272(R)

Lutetium isotopes Lu^{175}
energy levels, 9: 4274(J)
gamma angular correlations, 9: 4627(J)
nuclear levels, spins, and parities of, 9: 6118(J)
quadrupole moments, 9: 7130(J)

Lutetium isotopes Lu^{176}
decay, 9: 6530(J)

Lutetium isotopes Lu^{177}
beta emission, 9: 2058(J)
internal conversion, 9: 1994(R)

Lutidines
chemical reactions, 9: 5884(J)

Lymph system
(See also Leukocytes.)
uptake of Au^{198} colloids by axillary lymph-node metastases from breast cancer, 9: 7652(J)

Lymphocytes
abnormal, incidence following exposure to ionizing radiation in rats and mice, 9: 1710

Lysines
hydroxy-, biosynthesis and chromatographic determination of, in animal collagen, 9: 5598
metabolism of, in collagen of rat tissues, tracer study, 9: 6938(J)

M

McLeansboro Formation (Ill.)
geology and radioactivity of coal and shale deposits in, 9: 6653

Magnesium
absorptiometric determination of, in Ti and Ti alloys, 9: 1198(J)
backscattering from bombarded by 1- and 2-Mev electrons, 9: 2041(J)
chromatographic determination of, in mixtures of Na, K, Mg, and Ca, 9: 3400(J)
combustion in air and O_2 and thermal capacity, 9: 3498(R)
corrosion and polarization in $NaCl-Na_2CrO_4$ solutions and anodized coatings on, 9: 3870, 5051(R)
corrosion by hydraulic fluids, 9: 2795(R)
corrosion testing, methods for cleaning exposed specimens for, 9: 953(J)
detection of, on Al by colorimetric spot tests, 9: 1196
effects of, on the response of mice to large doses of whole-body irradiation, 9: 6846(J)

Magnesium (cont'd)
electron emission from, bombarded by hydrogen ions, 9: 250(J)
electron energy losses in thin foils of, 9: 5790
electroplating on, procedure, 9: 3881(J)
fast neutron differential scattering cross section, 9: 6041(J)
gamma reactions, N^{17} yield curve from, 9: 3644
inert-gas welding of, for aircraft parts, 9: 6301(J)
ion exchange separation and titrimetric determination of Li, K, and Na in presence of, 9: 1200(J)
level in blood serum, effects of irradiation, 9: 5223(J)
natural and synthetic anodic films on, 9: 3852(R)
neutron reactions (n,nγ), γ spectra from, 9: 4598(J)
oxidation of, under conditions of linear temperature increase, 9: 182
photonuclear reactions, 9: 2449(J)
plastic deformation and stress, 9: 7822
properties and reactor applications, 9: 6476
protective effects of, against radiation injuries, in Hydra, 9: 41(J)
proton reactions (p,n), angular distributions and yields at 23 Mev, 9: 4290(J)
radioactivity induced in, by pile radiation, 9: 6105
scattering cross sections for deuterons at 4.0 to 7.8 Mev and protons at 3.0 to 6.5 Mev, 9: 2944(J)
spectrochemical determination of, in Al alloys using rotating disc electrode, 9: 7701(J)
spectrochemical determination of, in Ti and Ti alloys, 9: 4944
thermal properties, effect of rare earth additions on, 9: 5342(R)
twinning and untwinning in, 9: 2771(J)
volumetric analysis for MgO, 9: 7694
welding of, survey and bibliography, 9: 1851(R)

Magnesium (liquid)
explosions with water, prevention of, 9: 1743

Magnesium alloys
analysis for B and effects of B on mechanical properties, 9: 3480
corrosion by salt water, 9: 5652(R)
corrosion testing, methods for cleaning exposed specimens for, 9: 952(J)
creep, absolute rate theory of, 9: 5057
determination of Zr in, using p-bromo- and p-chloromandelic acid, 9: 4731(J)
extrusion, effect of alloying elements on, 9: 5652(R)
history of, in foundries in the U. S., 9: 7372(J)
mechanical properties, effects of temperature and unstable microstructure on, 9: 3510
natural and synthetic anodic films on, 9: 3852(R)
polarization in salt–chromate solutions, 9: 5051(R)
powder metallurgy, 9: 5652(R)
preparation, analysis, corrosion, and mechanical properties, effects of alloying elements on, 9: 3871
preparation and mechanical properties, alloying effects on, 9: 5653(R)
properties and reactor applications, 9: 6476
tensile and creep properties and electric conductivity at room and elevated temperatures of sand-cast and sand-extruded, containing Th, rare earths, and Zr, 9: 1852(R)
with thorium, rare earths, and Zr, room- and elevated-temperature mechanical properties and heat treatment, 9: 3840(R)
welding of, survey and bibliography, 9: 1851(R)

Magnesium–aluminum alloys
chemical analysis and creep resistance, 9: 4161(R)
compression strength properties, 9: 3865(R)
creep, activation energies for, 9: 5961
creep of, effects of structure on, at high temperature, 9: 2732
creep of, grain-boundary movement, slip, and fragmentation during, 9: 2321(J)

Magnesium–aluminum alloys (cont'd)
creep testing at 300° to 600°F and microstructure, 9: 5050
electrolytic polishing, 9: 4189(J)
formation of foamed metal low-density core material of, for sandwich construction, design of equipment for, 9: 3182
formation of low-density foams of, methods and equipment for, 9: 3181
interaction of precipitation, solid-solution content, and creep in, 9: 1270
intercrystalline corrosion, due to aging, 9: 4143(J)
sand casting of, development of inhibitors, review, 9: 3476
soft x-ray spectra, 9: 3697(J)
solid solutions of, effects of temperature and grain size on flow and fracture strengths of α, 9: 3172(R)
weld crack sensitivity in, effects of separation stresses, form of separation of intermediate phases, shrinkage cavities, and unusual shrinking stresses on, 9: 196

Magnesium–aluminum–copper alloys
aging characteristics, 9: 2323(J)
fatigue testing in different stress ranges, 9: 5061

Magnesium–aluminum–copper–manganese alloys
corrosion, effects of heat treatment on, 9: 4143(J)
exaggerated grain growth of extruded, 9: 1545(J)
fretting corrosion, fatigue, surface friction, 9: 6262

Magnesium–aluminum–copper–silicon systems
constitution diagrams at 460°C, 9: 6298(J)

Magnesium–aluminum–copper–zinc alloys
fatigue testing in different stress ranges, 9: 5061

Magnesium–aluminum–lithium alloys
magnesium-rich corner of 100, 200, 375°C isothermal sections of, 9: 2760(J)
phase relations in, 9: 3166, 3481, 3484(R)

Magnesium–aluminum–manganese alloys
weld crack sensitivity in, effects of separation stresses, form of separation of intermediate phases, shrinkage cavities, and unusual shrinking stresses on, 9: 196

Magnesium–aluminum–silicon systems
electrolytic polishing, 9: 4189(J)
heat treatment of, and relation to behavior of Si in, 9: 6319(J)
mechanical properties, effects of Na on, 9: 5957

Magnesium–aluminum–zinc alloys
precipitation, textural phenomena occurring during, 9: 6315(J)
stress corrosion of, due to $MgZn_2$, 9: 4143(J)

Magnesium–beryllium alloys
alloying effect of Be on properties of, 9: 982(J)

Magnesium borides
preparation, properties, and crystal structure of MgB_2, 9: 5909

Magnesium–cadmium alloys
ordering in, 9: 637
thermodynamic properties, 9: 2735(R), 7351(R)

Magnesium–calcium alloys
mechanical properties, rolling, and structure, 9: 4160(R)

Magnesium–cerium alloys
creep, 9: 5342(R)
creep behavior and microstructure, 9: 192
grain boundaries, microscopy, 9: 4161(R)

Magnesium–cesium alloys
crystal structure, 9: 683(J)

Magnesium chelates
with 2,4-pentanedione, formation constants, enthalpy, and entropy, 9: 3390(J)

Magnesium chloride–lithium chloride systems
thermodynamic properties, 9: 7108(J)

Magnesium chloride–potassium chloride systems
thermodynamic properties, 9: 7108(J)

Magnesium chloride–rubidium chloride systems
thermodynamic properties, 9: 7108(J)

Magnesium chloride–sodium chloride systems
thermodynamic properties, 9: 7108(J)

Magnesium chlorides
dehydration with liquid NH_3, 9: 64
thermodynamic properties in fused alkali metal chlorides, 9: 3768(J)
thermodynamic properties of, in solutions with alkali metals, 9: 7108(J)

Magnesium compounds
polarographic behavior of, in molten ammonium formate, 9: 7292

Magnesium crystals
effects of temperature and grain size on flow and fracture strengths of, 9: 3172(R)

Magnesium fluoride–calcium fluoride–lithium fluoride systems
phase studies, 9: 7707

Magnesium fluorides
thermal conductivity and thermal diffusion, 9: 1283

Magnesium hydrides
preparation by the reaction of H on Mg metal and properties of, 9: 848

Magnesium ions
activity measurements with resin membrane electrodes, 9: 2149(J)
equilibrium formation constants for reaction in aqueous solution of acetylacetonate ion with, 9: 1752(J)

Magnesium isotopes Mg^{23}
beta emission, 9: 1121

Magnesium isotopes Mg^{24}
deuteron reactions (d,d), 9: 1066(R)
energy levels, 9: 1359(J)
gamma reactions (γ,n) and (γ,p), cross sections, 9: 3301(J)
gamma reactions (γ,p) and (γ,n), yield ratios, 9: 3300(J)
gamma spectra and spins and parities, 9: 7914(J)
neutron reactions (n,p), 9: 798(J)
photoneutron cross sections, 9: 5481(J)

Magnesium isotopes Mg^{25}
activation determination with α source, 9: 1650(J)
nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)
photoneutron cross sections, 9: 5481(J)
proton reactions (p,γ), 9: 3302(J), 3303(J)
proton reactions (p,γ), resonances and comparison of positron–γ yields, 9: 2453(J)
proton reactions (p,n), 9: 1067(R)
proton reactions (p,n), threshold value in, 9: 7551(J)
proton reactions (p,2p), (p,α), and (p,2α), excitation functions for, compared to N^{14}-induced reactions in C^{12}, 9: 1649(J)
stripping reactions and energy levels, 9: 6540(J)

Magnesium isotopes Mg^{26}
proton reaction (p,n), 9: 1067(R)
proton reaction (p,n), threshold value in, 9: 7551(J)

Magnesium–lanthanum alloys
crystal structure, 9: 683(J)

Magnesium–lead alloys
corrosion properties and electrode potentials of, in various media, 9: 4143(J)

Magnesium–lithium alloys
constitution diagram of, 9: 2768(J)
marine-atmosphere corrosion, 9: 4441(J)
mechanical properties, rolling, and structure, 9: 4160(R)

Magnesium–lithium alloys (cont'd)
ordered structure proposed for Li_3Mg_8, 9: 5693
thermodynamic properties, 9: 2294(R)

Magnesium–lithium–silver alloys
constitution diagram of, 9: 2768(J)

Magnesium–lithium–zinc alloys
phase relations in, 9: 3166

Magnesium–manganese–rare earth alloys
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)

Magnesium neodymium nitrates
paramagnetic resonance spectra, 9: 5188(J)

Magnesium nitrides
vaporization, 9: 2627(J)

Magnesium oxide–calcium oxide systems
magnetic susceptibility of, at elevated temperatures, 9: 996(J)

Magnesium oxide crystals
electric conductivity induced in, by electron bombardment, 9: 3900, 6796(J)
x-ray scattering effects due to lattice defects, 9: 7835(J)

Magnesium oxide films
electric conductivity and microstructure, 9: 3870

Magnesium oxide–silicon oxide systems
thermal conductivity, 9: 4779(R)
thermal conductivity, methods of measurement, 9: 7327(R)

Magnesium oxide–titanium systems
powder metallurgy, 9: 3496

Magnesium oxide–uranium oxide systems
oxidation of, phase diagrams, 9: 1796(J)
phase studies, 9: 925

Magnesium oxide–zirconium oxide systems
phase studies, 9: 4781(J)

Magnesium oxides
dielectric properties and solid-state reactions of, with binary, ternary, and quaternary systems of CaO, SnO_2, and TiO_2, 9: 3820(J)
discoloration by its own lattice members, 9: 7401(J)
neutron scattering cross sections and x-ray diffraction correlation, 9: 7169(J)
partial pressures of gaseous, and heats of sublimation and dissociation, 9: 5885(J)
reaction of Th with, at high temperatures, 9: 1247
thermal conductivity at 70°C, 9: 6868
volumetric determination in Mg, 9: 7694

Magnesium powders
production equipment, operating procedures, sampling, and packaging, description of, 9: 2278
production methods and equipment, particle size measurement, and explosive limits, 9: 2277

Magnesium praseodymium nitrates
paramagnetic resonance spectra, 9: 5188(J)

Magnesium–rare earth alloys
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)

Magnesium–rare earth–zirconium alloys
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)

Magnesium samarium nitrates
paramagnetic resonance spectra, 9: 5188(J)

Magnesium silicates
catalytic properties of, in γ ionization of Ag_2SO_4 solutions, 9: 6223(J)

Magnesium silicides
electric properties, 9: 4266(R)

Magnesium silicides (cont'd)
electric properties of Mg_2Si, 9: 5755(R)
Magnesium–silicon systems
soft x-ray spectra, 9: 3697(J)
Magnesium–strontium alloys
crystal structure, 9: 683(J)
Magnesium–thorium alloys
determination of solubility of Th in Mg at 1050°F, 9: 4161(R)
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)
solid solutions of Th in magnesium, 9: 5050
Magnesium–thorium alloys (liquid)
electromagnetic pump and heating transformer for, design, 9: 931
Magnesium–thorium–zirconium alloys
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)
Magnesium–tin alloys
corrosion of, in 95°C, low-conductivity, aerated, distilled water, 9: 2725
Magnesium titanates
crystal structure, 9: 3844(R)
Magnesium–titanium alloys
compressive, bearing, and shear creep-rupture properties of, at elevated temperatures, 9: 5361
constitution diagrams, 9: 2761(J)
heat treatment, 9: 3486(R)
Magnesium uranates
crystal structure, 9: 2226(J)
Magnesium–uranium(IV) fluoride systems
thermal conductivity and thermal diffusion, 9: 1283
Magnesium–zirconium alloys
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)
tungsten-argon arc welding of, 9: 2737
Magnet coils
design for cloud chambers, 9: 2862(J)
Magnet Cove Area (Ark.)
geophysical exploration, 9: 7333
Magnetic fields
(See also Electromagnetic fields; Fluxmeters.)
anomalous skin-effect in, theory of, 9: 6680(J)
behavior of an ionized gas in, 9: 1941(J)
design of magnetostriction magnetometer, 9: 6677
diffusion of plasma electrons and ions across, 9: 4497(J)
effect on Cherenkov radiation of particle traversing, 9: 2043(J)
effect on energy spectrum of electrons in semiconductors, 9: 7048(J)
electron beam focusing by, field calculations, 9: 5403(J)
electron optics in, solution of equations of, 9: 5400(J)
electron optics of straight slit, 9: 5401(J)
emission of photons and electron-positron pairs in, 9: 414(J)
focusing electron beams with, positive ion drainage from, 9: 7406(J)
gradient measuring instrument, design, 9: 5102(J)
gradient meter, 9: 5755(R)
high-order focusing of charged particles by, 9: 2804(J)
influence on nuclear quadrupole resonance, methods of, 9: 7507(J)
lenses, focusing properties of cylindrical, 9: 5402(J)
measurement and testing of, of Bevatron, 9: 3663
measurement of, by bismuth wire fluxmeter, 9: 6710
measurement of, using proton magnetic resonance, 9: 3916(J)
measurement with Bi wires, 9: 3577
Magnetic fields (cont'd)
measuring instrument for, 9: 276(J)
nuclear induction in, 9: 5759(J)
particle orbits in, in alternating gradient channel using permanent bar magnets, 9: 395
polaron semiconductor in presence of, 9: 7395(J)
stabilization, use of transistors in, 9: 6376
trajectory of charged particles in, with axial symmetry, calculation, 9: 5118
visual observation of lines of force using gas discharge tube, 9: 7397(J)
Magnetic moments
(See also Nuclear magnetic moments.)
of deuterons, meson correction to, 9: 7971(J)
in π electron systems, 9: 5198(J)
of protons, 9: 7529(J)
ratio of Co^{58}/Co^{60}, 9: 6060(J)
of stable gallium isotopes, ratio of, 9: 7137(J)
Magnetic monopoles
photon production by coupling to elementary particles, 9: 6132
Magnetic properties
of metals, and ferromagnetism, quantum theory of, 9: 6553(J)
method for measuring Curie points of metals and alloys, 9: 4453
Magnetic recording systems
of data from time-of-flight analyzer, 9: 5993(J)
Magnetic resonance
(See also Nuclear magnetic resonance.)
absorption of protons in linear polyamides, 9: 7503(J)
absorption spectra in Ce, Nd, and Pr, 9: 2075(J)
absorption theory, 9: 1628(J)
absorption theory, stochastic, 9: 1629(J)
focusing atomic beam apparatus for measurement of, 9: 6001
for linearly and circularly polarized radio-frequency radiation, 9: 6811(J)
in rare earth metals, theory, 9: 2074(J)
recording high-sensitivity paramagnetic resonance spectrometer, 9: 2391(J)
review, 9: 7960(J)
Magnetism
measurement at liquid He temperatures, 9: 4209
remanent, in toroids, 9: 7166
Magneto-optical rotation
Faraday effect at centimeter waves, 9: 6682(J)
Magnetometers
design, 9: 4039(R)
design of, for observation of magnetostriction, 9: 6677
Magnets
(See also Magnet coils.)
design and analysis of, for CERN synchrotron, 9: 388, 1652
design of, for CERN synchrotron, 9: 1387, 6494
design of, for focusing atomic beam apparatus, 9: 6001
effective permeability of laminated, under dynamic conditions, 9: 389
electro-, for measuring magnetic susceptibility, design, 9: 512
of high-energy proton synchrotrons, power supply for, 9: 1098
of proton synchrotrons, correction of field index of, with compensation windings, 9: 7557
Maine. Univ., Orono
progress reports on fluorocarbon systems, 9: 6209(R)

Maize

chromosomes of, aberrations induced by exposure to x radiation and ultraviolet radiation, 9: 7236(J)

radioinduced endosperm mutations in, 9: 28(J)

Majuba Hill Mine (Nev.)

geology, mineralogy and U distribution, 9: 6963

uranium distribution, 9: 1260(J)

Maleic acid

effects of, on radiosensitivity of yeast, 9: 6166(J)

Maleic anhydride

effects of pretreatment with, on mitotic effects of radiation on cells of Vicia, 9: 4922(J)

Mallory, P.R. and Co., Inc., Indianapolis

progress reports on manufacture of Ti alloys, 9: 1267(R), 2717(R)

Malonic acid

carbon isotope effect in decarboxylation of mono-anion of, in quinoline solution, 9: 6888(J)

decarboxylation of, at 140.5°, intramolecular isotope effects of C^{14} and C^{13} in, 9: 871(J)

effects of, on radiosensitivity of yeast, 9: 6166(J)

Maltose

preparation of, labeled with C^{14}, 9: 6628

Mammals

(See also specific mammals; see also Animals.)

adaptation of, to ionizing radiation, review, 9: 4043

cells and tissues, radiosensitivity, factors affecting, 9: 3015(J)

immediate and late effects of total-body exposure to radiation on, review, 9: 3368(J)

relative biological effectiveness of various radiations in mice, rats, rabbits, and men, 9: 3007

Man

natural radioactivity in, determination of, using a differential high-pressure ionization chamber, 9: 444(J)

radioinduced mutations in, review, 9: 4923(J)

Mandelic acid

analytical use of, for determination of Th, 9: 2643(J)

Manganese

activation determination in biological materials, 9: 4205(R)

adsorption and distribution of, effects of complexing agents on, tracer study, 9: 2099(R)

analysis of ocean sediments of, for Th, 9: 3819(J)

colorimetric and volumetric determinations of, in Ti and Ti alloys, 9: 4944

colorimetric determination of, by oxidation with bromate in sulfuric acid medium, 9: 2637(J)

colorimetric determination with leuco malachite green, 9: 5599

compressibility parameters and Grüneisen's constants, 9: 1863

curved-crystal x-ray spectrometric microdetermination of, in Al alloys, 9: 3435(J)

determination in U by ion exchange, 9: 884(J), 1793(J)

determination of, in high-temperature alloys using anion-exchange separations, 9: 1544(J)

dissolved in NaF–KF mixture, relative position in the electrochemical series of, 9: 6310(J)

electroforming from chloride and chloride–sulfate baths, 9: 3495

energy levels study by means of electric excitation by protons, 9: 5476(J)

high-temperature scaling, 9: 6261(R)

hyperfine structure, 9: 4901(J)

isotopic exchange in the Mn^{++} and MnO_4^- reaction, 9: 6631(J)

isotopic exchange reactions between Mn^{2+} and MnO_4^-, 9: 6178

magnetic susceptibility, 9: 5087(J)

Manganese (cont'd)

mechanical properties and microstructure of flash-welded, 9: 964

metabolism of, 9: 5206(R)

neutron transmission and resonances, 9: 988(R)

occurrence, production, properties and uses, 9: 6676(J)

in vivo partition of, among some organs and intracellular organels of the rat, 9: 4663(J)

proton stopping cross section, 9: 2026

quantitative determination of divalent, using a high-frequency oscillator and ethylenediaminetetraacetic acid, 9: 2169(J)

reaction with fused NaOH, 9: 1466(J)

separation from solutions containing cations, 9: 2331(R)

spectrographic determination in Bi, 9: 1475

spectrographic determination of, in ores and rocks, 9: 162

thermal neutron activation cross section of, 9: 6102(J)

x-ray spectra (soft), 9: 452(J)

Manganese alloys

binary and ternary, physical properties, 9: 6676(J)

casting and forging for gas turbine application, 9: 3869

room- and elevated-temperature mechanical properties and heat treatment, 9: 3840(R)

Manganese–aluminum–chromium alloys

crystal structure, 9: 2373(J)

Manganese–aluminum–copper–magnesium alloys

corrosion, effects of heat treatment on, 9: 4143(J)

exaggerated grain growth of extruded, 9: 1545(J)

fretting corrosion, fatigue, surface friction, 9: 6262

Manganese–aluminum–magnesium alloys

weld crack sensitivity in, effects of separation stresses, form of separation of intermediate phases, shrinkage cavities, and unusual shrinking stresses on, 9: 196

Manganese–aluminum–titanium alloys

analysis of, for H, 9: 3077(J)

casting and mechanical properties of as-cast and wrought, 9: 184

compression properties and microstructure, 9: 3475

fabrication, heat treatment, phase studies, mechanical properties, microstructure, and aging characteristics, 9: 1856

hardness, crystal structure, and phase studies, 9: 3520

high-temperature tensile properties of annealed sheet and bar, 9: 3198(J)

machining and grinding, 9: 4174

phase studies and microstructure, 9: 1873(J)

transformation characteristics, microstructure, heat treatment, and mechanical properties, 9: 4807(R)

transformation temperatures, age hardening, heat treatments, and mechanical properties, 9: 1534

Manganese antimonides

magnetic properties, 9: 1067(R)

Manganese–bismuth alloys

large magnetic Kerr rotation in, 9: 1540

Manganese–carbon–titanium systems

fabrication, heat treatment, phase studies, mechanical properties, microstructure, and aging characteristics, 9: 1856

heat treatment, mechanical properties, microstructure, and phase studies, 9: 180(R)

phase studies and microstructure, 9: 1873(J)

Manganese chelates

with 2,4-pentanedione, formation constants, enthalpy, and entropy, 9: 3390(J)

Manganese chlorides

specific heat and magnetic properties at low temperature, 9: 1067(R)

Manganese–chromium–iron–molybdenum–titanium alloys
mechanical properties and microstructure of extruded and heat treated, effects of temperature, pressure, and die angle on, 9: 2276(R)
Manganese–chromium–iron–molybdenum–titanium–vanadium alloys
heat treatment, mechanical properties, phase studies, tensile properties, and welding, 9: 2298
tensile properties, hardness, and flash weldability, 9: 3856
Manganese–chromium–molybdenum–titanium alloys
microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296
Manganese–chromium–titanium alloys
grain structure, hardness, heat treatment, mechanical properties, phase studies, and welding, 9: 2298
Manganese–cobalt–molybdenum alloys
oxidation at 940°C, 9: 3146
Manganese complexes
with 2, 2'-bipyridine and 1,10-phenanthroline, chemical properties, 9: 512
Manganese compounds
polarographic behavior of, in molten ammonium formate, 9: 7292
Manganese(II) fluorides
crystal structure, 9: 92(J)
Manganese hydrides
preparation of, by reaction with atomic H, 9: 635(R)
Manganese ions
equilibrium formation constants for reaction in aqueous solution of acetylacetonate ion with, 9: 1752(J)
separation by ion exchange, 9: 910(J)
Manganese isotopes Mn^{52}
half lives, 9: 1066(R), 2971(J)
Manganese isotopes Mn^{53}
production and nuclear properties, 9: 7126(J)
Manganese isotopes Mn^{54}
half life, 9: 2971(J)
nuclear orientation at low temperatures and γ radiation from, 9: 747(J)
polarization of γ rays emitted by oriented, 9: 748(J)
Manganese isotopes Mn^{55}
Coulomb excitation functions and energy levels for, bombarded with 3.5-Mev α particles, 9: 423(J)
energy levels, 9: 3319(J)
inelastic neutron scattering in, 9: 3319(J)
nuclear quadrupole moment, 9: 4901(J)
Manganese–magnesium–rare earth alloys
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)
Manganese–mercury alloys
phase studies and crystal structure, 9: 3204(J)
Manganese–molybdenum–nickel alloys
oxidation at 940°C, 9: 3146
Manganese–nickel alloys
brittle failure of brazing wire containing 60% Mn, causes and prevention, 9: 4169
heat capacities, 9: 5077
high-temperature scaling, 9: 6261(R)
neutron-diffraction studies of magnetic structure of, 9: 2312(J)
x-ray-diffraction analysis using high-temperature furnace, 9: 4822
Manganese–nickel–oxygen systems
phase diagrams, 9: 6261(R)
Manganese–nickel–uranium alloys
pseudo-binary phase sections between Laves phases in, 9: 3353(J)
Manganese–nitrogen–titanium systems
fabrication, heat treatment, phase studies, mechanical properties, microstructure, and aging characteristics, 9: 1856
Manganese–nitrogen–titanium systems (cont'd)
phase studies and microstructure, 9: 1873(J)
Manganese ores
production of Mn from, 9: 6676(J)
Manganese oxides
ceramics, resistivity of, 9: 5946(J)
energy distribution of neutrons scattered by, 9: 6750(J)
heat and free energy of formation, 9: 529(J)
isotopic exchange with O_2 and water vapor, 9: 5254(J)
oxidation of chloride ions in presence of HNO_3, 9: 5623
Manganese–oxygen–tantalum systems
metallic ternary phases in, 9: 3185(J)
Manganese sulfates
energy distribution of neutrons scattered by, 9: 6750(J)
Manganese–titanium alloys
analysis of, for H, 9: 3077(J)
casting and mechanical properties of as-cast and wrought, 9: 184
creep of as-received and heat-treated, at 76, 210, 400, and 600°F, aging effects on, 9: 3479(R)
creep of heat-treated and as-received, at 76, 210, 400, and 600°F, 9: 3478(R)
creep of RC 130A, 9: 168(R)
electric resistance, microstructure, phase studies and impact and tensile properties of heat-treated, 9: 974
extrusion, effect of temperature and die design on, 9: 6292
fabrication and mechanical properties, 9: 3858
hardness, heat treatment, and microstructure, 9: 4186
hardness and microstructures of welded RC-130A, 9: 3493(R)
heat treatment, tensile properties, and impact tests, 9: 4787
heat treatment response, effect of α solutes on, 9: 1673(J)
high-temperature tensile properties of annealed sheet and bar, 9: 3198(J)
impact strength and hardness of weld-thermal-cycled heat-affected zone, 9: 3001
machining and grinding, 9: 4174
mechanical properties, effect of H on, 9: 1857(R)
microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296
microstructure and continuous cooling transformation, 9: 4801
phase studies, bend ductility, and tensile strength of welded and unwelded RC-130A, 9: 3493(R)
phase studies and physical properties, 9: 1528
precipitation hardening, heat treatment, and embrittlement of high-strength, 9: 4462
spot welded joints in, 9: 1839(R)
tensile properties, 9: 1848(R)
transformation characteristics, microstructure, heat treatment, and mechanical properties, 9: 4807(R)
welding of RC-130A, effect of heat treatment and surface contamination on, 9: 227(J)
welds, static and fatigue properties, 9: 5370(J)
Manley Hot Springs District (Alaska)
uranium distribution in, 9: 1523(J)
Manometers
(See also Pressure gages; Vacuum gages.)
multitube, digital reader system for, 9: 4476
Marie and Mary Claim (S. Dak.)
uranium and Th distribution, 9: 165(J)
Marysvale Area (Utah)
mineralogy, 9: 1829
Mass spectrography
(See also appropriate subheadings under specific materials.)

Mass spectrography (cont'd)
atomic mass difference determination by, 9: 730(J)
bibliographies, 9: 4236
capillary leaks for continuous sampling of gas streams, 9: 2841(J)
continuous sampling of gas streams for analyses by, capillary leaks for, 9: 2841(J)
determination of O in H_2O by, 9: 6723(J)
ion source for elimination of memory effect and source geometry changes, 9: 5560(P)
manual on, used routinely at Arco Chemical Plant, 9: 6896
operational characteristics of various ion analyzers, 9: 7059
of organochlorsilanes, 9: 5105(J)
procedures for U and Pu analysis in ANL manual, 9: 4074

Mass spectrometers
(See also Calutrons; Electromagnetic separation; Ion sources; Line recorders.)
bibliography on, 9: 1961
calibration of, using standard samples of H_2-T_2, 9: 3248
control of gas inflow, apparatus for, 9: 8006(P)
control of oscillating electrons in, apparatus for, 9: 8003(P)
design and applications, 9: 5104(J), 6395(J)
design and operation of, and use in study of 93 mass isotopes of Mo and Tc, 9: 7442
design for analysis of cosmic particles, 9: 5089(J)
design of, for instantaneous analysis of gas mixtures, 9: 1578 (R), 1579(R)
design of, optics of electrical charges applied to, 9: 6396(J)
design of magnetic time-of-flight, 9: 1444(P)
design of panoramic, for chemical kinetic studies, 9: 2407
design of π-type, for isotope abundance measurements, 9: 6010(J)
for determination of low concentrations of deuterium in hydrogen, design, 9: 3920
development of a refrigeration system to increase sensitivity, 9: 5931
development of countercurrent pulse columns for, 9: 5933
dissociation of molecular H and D beams in, 9: 5417(J)
electrical control circuit in the ion source, 9: 7995(P)
electrical discharge in ion source, automatic control, 9: 7996(P)
gas-handling system for, design, 9: 7852
improved ion source for, for analysis of solids, 9: 1595(J)
ion source, current stabilizer for filament, 9: 5408(J)
ion source electron current and energy regulator for, 9: 1031(J)
ion source in, structure, 9: 8008(P)
ion source without auxiliary magnetic field for, 9: 5103(J)
magnetic-period, design, 9: 5586(P)
magnetometer for, for mass indication and spectra calibration in mass range 2 to 400, 9: 276(J)
metering of magnetic field of, by bismuth wire fluxmeter, 9: 6710
peak-height comparison method for, 9: 1514(J)
π-f, for the instantaneous analysis of gas mixtures, design, 9: 3918(R), 3919(R)
π-f, modifications in, for use in gas mixtures analysis, 9: 6193
reduction of background ion peaks in, 9: 7993(P)
for resolution of cosmic ray particles, 9: 1918(J)
resolving power, increasing with heterogeneous magnetic field, 9: 2843(J)
short circuit elimination in, 9: 8000(P)
temperature control for ion source, 9: 7994(P)
time-of-flight, design, 9: 4506(J)
trap-current controlled emission regulator for ion source for, 9: 2408
tubes for non-magnetic π-f, 9: 5416(J)
two-stage magnetic analyzer for isotopic ratio determinations, 9: 6000(J)
use in determining atomic masses, 9: 5997(J), 6722(J)

Mass spectrometers (cont'd)
utilizing crossed electric and magnetic fields, proposed design, 9: 4246
vacuum lock design for insertion of solids, 9: 7878(J)

Mass transfer
(See also appropriate subheadings under specific materials, processes and devices involved.)
analogy between heat transfer and, in turbulent flow, 9: 4132
effect of, on corrosion of Ni by molten NaOH, 9: 951(J)
generalized coefficients, tables, 9: 5622
inhibition of, in stainless steel–liquid Na systems, 9: 4175(R), 5857(R), 6958
in irradiated stainless steel loops circulating liquid Na, measurement, 9: 4179(R)
review, 9: 3222(J)
in sodium and NaK, testing, 9: 6999(R)
in stainless steel loops, effect of area on, 9: 4179(R)

Massachusetts Inst. of Tech., Cambridge
progress reports, 9: 3111(R)
progress reports on adaptation of new research techniques to mineral engineering problems, 9: 623(R)
progress reports on cold working and recrystallization, 9: 973(R), 2295(R), 4459(R)
progress reports on creep structure characteristics of Ti and its alloys, 9: 175(R), 5341(R)
progress reports on isotopic abundances of Sr, Ca, and A and related topics, 9: 4234(R)
progress reports on mechanical properties of sintered Al powder, 9: 4166(R)
progress reports on metal-ceramic interactions at elevated temperatures, 9: 653(R), 2702(R), 4777(R), 7752(R)
progress reports on metallurgy, 9: 2727(R)
progress reports on Ra and MsTh poisoning and instrumentation technique, 9: 5721(R)
progress reports on solid solutions and grain boundaries, 9: 972(R), 2294(R), 4458(R)
progress reports on solid-state and molecular theory, 9: 6546(R)
progress reports on thermal conductivity of refractory materials, 9: 946(R), 2793(R), 7327(R), 4479(R)
progress reports on thermodynamics of metal solutions, 9: 3177(R)
progress reports on vapor-deposited coatings, 9: 4162(R)

Massachusetts Inst. of Tech., Cambridge. Lab. for Nuclear Science and Engineering
progress reports, 9: 1066(R), 2331(R), 4205(R)

Massachusetts Inst. of Tech., Cambridge. Lubrication Lab.
progress reports on frictional properties of Ti and its alloys, 9: 961(R), 3487(R)

Massachusetts Inst. of Tech., Cambridge. Research Lab. of Electronics
progress reports, 9: 652(R), 4210(R), 7025(R)

Massachusetts Inst. of Tech., Cambridge. Servomechanisms Lab.
progress reports on electronic nuclear instrumentation, 9: 7070(R), 7454(R)

Massachusetts Inst. of Tech., Cambridge. Solid State and Molecular Theory Group
progress reports, 9: 231(R), 4479(R)

Materials of construction
(See Building materials.)

Materials testing
(See also the specific material or equipment concerned or properties being tested; see also specific testing procedures, e.g., Sonic inspection; see also Mechanics; Metallurgy.)

Materials testing (cont'd)
bibliography of ultrasonic nondestructive testing, 9: 2237
criterion for minimum scatter in fatigue testing, 9: 1816
design of a resonance-vibration exciter and controller for, 9: 7746
eddy current bond thickness measurement, 9: 167(R)
equipment for testing relaxation of Ti, 9: 3505(R)
evaluation of xeroradiography for, 9: 3816
gas seal for high-temperature tensile tests in inert atmospheres, 9: 1498(J)
high-temperature underwater irradiation facility, design, 9: 4621(J)
influence of strain aging on shape of knee in stress-number diagram, 9: 6287
life test estimation procedures, 9: 3814
method for creep and stress-rupture tests, 9: 1251
non-destructive, of spent enriched uranium reactor fuel, statistical methods, 9: 5420
of spherical shape by thermal shock, 9: 1497(J)
survey of stress-strain recorders for, 9: 5637
techniques for failure testing of manufactured units, 9: 942
by thermal shock failure, 9: 1496(J)
Materials Testing Reactor
radiation dosages from γ irradiation facility, 9: 2050
reference material on, 9: 6479
shielding, efficiency, 9: 2446
temperature distributions in structure outside the reactor tank, 9: 759(J)
Materials Testing Reactor Mockup
equipment for disassembling in-pile circulating loop, 9: 752(J)
heat transfer analysis for sudden removal of cooling water, 9: 6065
Mathematical tables
of the Clebsch–Gordan coefficients, 9: 6399
functional approximations for digital computers, 9: 6398
$\sin^2 X$, X = [0°(0.001°)45°; 5D] 9: 7443
of statistical functions, 9: 1033(J)
of two-center Coulomb integrals between 1s, 2s, and 2p orbitals, 9: 4239
Mathematics
(See also Biometry; Computers; Constants and conversion factors; Statistics.)
application to chemistry and chemical engineering, review, 9: 3249(J)
Bessel function sub-routine for IBM 650 computations on reactors, 9: 7065
bibliography on linear programming and game theory, 9: 4847
calculation of generalized hypergeometric series with the Oracle, 9: 5719(J)
convergence of matrix iterations, 9: 4508
curve fitting a Gaussian function by least-squares method, 9: 2411
of differential systems with interface conditions, 9: 4240
eigenvalue problems in transport theory of neutrons, 9: 5137
factor analysis, general discussion of, 9: 6397
floating-decimal matrix inversion, 9: 4845
generalized spin representation, 9: 1416
integral formulas for initial reduction of transport equation, 9: 4884
iterative scheme for homogeneous linear equations, 9: 5716
polynomial and continued fraction approximations for functions, 9: 7444
solid angle calculations for spherical and disk geometries, 9: 7853
solution of elliptic differential equations by iterative methods, 9: 4846
solutions of wave mechanical problem of hydrogen complex structure, 9: 5718
status of studies by Mathematics Panel at ORNL, 9: 2845(R)
tables of electron scattering solutions by a point charge, 9: 1139
Mathematics (cont'd)
Tamm-Dancoff method in configuration space, 9: 2531
transport equation solution by S_n approximations, 9: 4507
Mauch Chunk Area (Penna.)
geology of, 9: 164(J)
Mayoworth Area (Wyo.)
exploration, geology, stratigraphy, and U distribution, 9: 956(J)
Mechanics
(See also specific geometric shapes, e.g., Cylinders; Spheres; see also Materials testing; Quantum mechanics; Stress analysis; Structures.)
linear elastic structures, response to dynamic loading and shock motion, 9: 3894
Medicine
applications of radioisotopes in, 9: 7608(J), 7647(J)
use of radioisotopes in, Hamburg conference on, 9: 7648(J)
Melamine
use as x-radiation detector, 9: 5127(J)
Melrose District (Mont.)
exploration for U and Th deposits in, 9: 1520(J)
Melting
(See also appropriate subheadings under specific materials; see also Furnaces.)
equipment and techniques of arc, for Zr and Zr alloys, 9: 6660
equipment for, design and performance of, for preparation of Ti-base alloy, 9: 1850(R)
resistance and induction zone, design and performance of apparatus for, 9: 1855(R)
technique of high-vacuum, 9: 195(J)
theory of, in elements, 9: 7387
theory of, in the alkali metals, 9: 7388
Membrane filters
efficiency of, for aerosol filtration, influence of electrostatic forces, 9: 4831
Membranes
(See also Films.)
porous-glass, operating characteristics, 9: 7747(J)
preparation, moisture content, capacity, thickness, and potential measurements of ion-exchange, of polystyrenesulfonic acid type, 9: 1753(J)
separation of gaseous mixtures by diffusion through, 9: 685(J)
Memory devices
bibliography on data storage and recording, 9: 3207
for high-speed computers, design, 9: 5099(J)
image processing, equipment for, 9: 5717
magnetic drum, for electronic computers, survey, 9: 1018
Mendelevium
production and identification, 9: 5306(J)
Mendenhall Strip Mine (S. Dak.)
occurrence of uraniferous lignite in, 9: 5002(J)
stratigraphy of U-bearing lignites in, 9: 622(R)
Mercaptans
(See Thiols.)
Mercapto group
in coenzyme A, radiosensitivity, 9: 2574(J)
content in normal and whole-body-irradiated mouse tissues, 9: 6829(J)
determination of, in tissues from rats, 9: 18
effects of mercaptoethylamine on radiosensitivity in rats, tracer study, 9: 7232(R)

Mercapto group (cont'd)
effects of p-chloromercuribenzoate on radiation injuries to yeasts, 9: 1712
protective effects of s,β-aminoethylisothiuronium·Br·HBr against radiation injuries in mice, 9: 5582(J)

Mercury
absorption of cosmic μ mesons, 9: 721
atomic form factors, calculation and survey, 9: 7407(J)
colorimetric determination in urine, 9: 5256
elastic scattering of high-energy electrons by, 9: 3321(J)
detection of, on Al by colorimetric spot tests, 9: 1196
heat transfer characteristics, effect of wetting on, 9: 1807(R)
gamma penetration and dose rates in, from Na^{24}, 9: 6783
gamma spectrum after thermal neutron capture, 9: 7907(J)
growth of whiskers by condensation of Hg vapor on glass surface, 9: 7815(J)
hyperfine structure of, extracted from neutron-irradiated gold, 9: 2524(J)
impact broadening of resonance line of, 9: 6544(J)
μ-meson capture by, transition probability for, in terms of dielectric charge distribution, 9: 1068(J)
neutron diffraction study, 9: 412(J)
neutron total cross sections, 9: 7124(J)
permeation of graphite by, mechanisms of, 9: 4480
photoneutron yield, measurement with NaI crystal, 9: 3944(J)
scattering of 0.32 mc^2 γ rays in, calculation, 9: 2480(J)
secondary electron production from, by Hg ions, 9: 1562(J)
solvent extraction from Tl(III), 9: 1066(R)
sparking potential in vapor of, measurement of, 9: 6693(J)
spectrographic determination of, in ores and rocks, 9: 162
suitability as a standard wavelength source extracted from neutron-irradiated gold, 9: 2524(J)
thermal conductivity coefficients from 150 to 540°C, measurement, 9: 3695
velocity of outflow of, into mercuric nitrate solutions of various concentrations, 9: 3766
wetting of Ti with, 9: 2766(J)
wetting properties of, on Cu and Hg, 9: 5052

Mercury, biscyclopentadienyl-
synthesis and reactions, 9: 4368

Mercury cathodes
isotopic separation of H_2 at, 9: 71(J)

Mercury compounds
diuretics containing, effects on mortality of irradiated rats, 9: 2548(R)
hydroxyfluoberyllates, preparation and properties, 9: 5900(J)
photochemical decomposition of H_2O, effect of HgS on, 9: 6611(J)

Mercury delay lines
application to memory circuit of digital computers, 9: 2410

Mercury electrodes
potential of Ag, AgCl and Hg, HgCl combination in HCl, 9: 2623(J)

Mercury ions
secondary electron production from Hg targets by, 9: 1562(J)

Mercury isotopes
determination of Hg^{202} in Hg by resonance absorption, 9: 532
optical studies of radioactive, 9: 1670(J)
use in standard wave length light sources, 9: 6717(J)

Mercury isotopes Hg^{189}
decay chain, 9: 5534(J)

Mercury isotopes Hg^{191}
decay chain, 9: 5534(J)

Mercury isotopes Hg^{195}
decay scheme, 9: 1409(J)

Mercury isotopes Hg^{198}
angular distribution of resonance fluorescence radiation from 411-kev excited state of, 9: 3685(J)

Mercury isotopes Hg^{199}
neutron inelastic scattering, 9: 4204(R)

Mercury isotopes Hg^{200}
neutron binding energy and nuclear angular moment, 9: 7907(J)

Mercury isotopes Hg^{201}
nuclear quadrupole moment, 9: 5480(J)

Mercury isotopes Hg^{202}
determination in Hg by resonance absorption, 9: 532
spin and lifetime of 439-kev excited state, 9: 4284(J)

Mercury isotopes Hg^{203}
decay scheme, 9: 2957(J)
heart excitation and inhibition studied by, 9: 7663(J)

Mercury–manganese alloys
phase studies and crystal structure, 9: 3204(J)

Mercury nitrates
poisoning of amylase with, 9: 3766
stress-corrosion testing in $HgNO_3$ solutions of Si bronze cyclotherm-type auxiliary boiler for nonmagnetic minesweepers, 9: 3169

Mercury(II) nitrates
velocity of outflow of Hg into solutions of, 9: 3766

Mercury oxides
heat and free energy of formation, 9: 529(J)

Mercury–polonium alloys
preparation and crystal structure of HgPo, 9: 5625

Mercury–sodium alloys
flammability of, at high temperatures, 9: 5590

Mesaverde Formation
stratigraphy, 9: 5327(J)

Mesaverde Formation (Ariz.)
geology, 9: 1828

Mesic atoms
energies of K transitions of π-mesonic x rays from, 9: 1909(J)
energy level displacement in, 9: 740(J)
energy levels of π-, estimation of shift in, 9: 4554(J)
excitation of nuclear rotational states in μ, 9: 2902(J)
nuclear fine structure in μ-mesic atoms, 9: 1634(J)
polarization shift of levels in, nuclear volume effect, 9: 2884(J)
vacuum polarization in, 9: 993(J)
x radiation (K series) from π-, 9: 671(J), 7082(J)
x radiation (L series) from π-, 9: 7083(J)

Mesityl oxide
extraction of Po, Bi, and Th with, 9: 2674(J)

Meson beams
negative μ, production and radio-chemical analysis of π^-/μ^- ratio, 9: 1057(J)

Meson cross sections (μ)
for star production, 9: 5740(J)

Meson cross sections (π)
photoproduction (285 and 345 Mev), in deuterium, 9: 6017(J)
for production by meson-nucleon reaction, 9: 5749(J)

Meson decay
equipment for time measurement, 9: 303

Meson decay (cont'd)
neutral π, energy of showers from, 9: 2360
selection rules for decay into 2 bosons, 9: 5456(J)
selection rules for decay into 2 particles of spin 0 and/or 1, 9: 5457(J)
Meson showers
angular distribution measurement, 9: 6343
high-energy, theory of, 9: 5746(J)
penetrating, production in hydrogen, 9: 5688(J)
Mesons
(See also Cosmic mesons; K particles; S particles; V particles.)
absorption of fast charged hyperons by nucleons, 9: 3611(J)
associated production of a positively charged meson and a hyperon, 9: 2881(J)
cascade decay of negative hyperon, 9: 4546(J)
classification of decay and production processes of, 9: 7521(J)
cloud chamber evidence for a charged counterpart of the θ^0 particle, 9: 1058(J)
cloud chamber investigations and summary of properties, 9: 4858
collision of high energy, with nuclei, 9: 1667(J)
decay of, angular correlation effects in, 9: 1988(J)
decay of, into three particles, energy spectrum of secondary particles, 9: 333(J)
decay of heavy, into 5 particles, 9: 1059(J)
decay of hyperon in flight with formation of σ star, 9: 1624(J)
decay of spin 0, into two leptons, 9: 6022(J)
detection in nuclear emulsions exposed to betatron proton beam and targets, 9: 2890(R)
double-star event in nuclear emulsion, 9: 3615(J)
energy relations in nuclear emulsions, tables of, 9: 1557(J)
existence of 1450 m_e, 9: 7478(J)
gamma decay lifetime of neutral, 9: 1621(J)
gamma radiation from decay of, detection, 9: 2099(R)
Gell-Mann theory of existence and interaction, 9: 6136(J)
heavy, decay, 9: 5455(J)
heavy, disintegration in flight, 9: 4539
heavy, formation in high-energy collisions, 9: 2880(J)
heavy, produced by 2.2-and 3.0-Bev protons in emulsions, 9: 6016(J)
heavy, review in Annual Review of Nuclear Science, 9: 3957(J)
heavy, summary of evidence on, 9: 2433
heavy unstable, detection by counter selection system and cloud chamber, 9: 3955(J)
high-energy pair production events at high altitude, 9: 1625(J)
hyperon decay and interaction events in nuclear emulsions, 9: 3614(J)
identification of new hyperon (Y_1^*), 9: 339(J)
interaction at rest of charged hyperon stopped in nuclear emulsion, 9: 3566(J)
interaction coupling theory with nucleons, 9: 1630(J)
interaction of mesons with, saturation of nuclear force by, 9: 337(J)
interaction with nucleons, S matrix for, 9: 335(J)
interaction with nucleons, theory, 9: 330(J)
interactions with nucleons, asymptotic Green function in pseudoscalar theory, 9: 7597(J)
ionization energy loss of, in NaI scintillation crystal, 9: 708(J)
K-mesonic decay of a slow secondary particle in cosmic radiation, 9: 3236(J)
from K-particle decay, identification and measurement, 9: 5133(J)
lifetime of heavy, measurements and method for measuring, 9: 3956(J)
mass, momentum, and range-energy relations, 9: 5129
Mesons (cont'd)
mass difference theory, 9: 1078(J)
mass of heavy unstable, 9: 3271
mathematical formulation of Gell-Mann model for, 9: 7202
mean life and decay theory, 9: 5135(J)
meson-nucleon scattering, S matrix expressed in Heisenberg representation for, 9: 3704(J)
model for production of single, 9: 7588(J)
models for the description of hyperon structure and interactions, 9: 3613(J)
multiple production, 9: 5748(J)
multiple production, hydrodynamic theory, 9: 6744(J)
multiple production, mechanism, 9: 5451(J)
multiple production, theory, 9: 3604(J), 4026, 4027(J), 7482(J), 7486(J)
multiple production at 1 to 2.2 Bev, theory, 9: 6741(J)
multiple production of, charge and isotopic-spin conservation, 9: 3269(J)
multiple production of, in emulsions exposed to Bevatron beam, 9: 4860
multiple production theories applied to cosmic showers, 9: 7039(J)
nucleon scattering by, Tamm-Dancoff theory of, renormalization in, 9: 6135(J)
observation of delayed decay of neutral or charged hyperon, 9: 1005(J)
phenomenological study of Λ, and Λ nuclei, 9: 3612(J)
photoproduction, relation between meson-nucleon scattering and, 9: 4651(J)
production, theory, 9: 4547(J)
production by nucleon-proton collisions, 9: 1069(J)
production by peripheral nucleon collision, theory, 9: 1338(J)
production in high-energy interactions and energy determination, 9: 6343
production of heavy, 9: 5741(J)
production of heavy, unstable, from p-p collisions (2.7 Bev), 9: 6038(J)
production of photo-, by meson-nucleon scattering, 9: 2044(J)
properties of heavy, from absorption experiments, 9: 6025(J)
renormalization of a neutral vector meson interaction with fermions, 9: 1694(J)
scattering by light nuclei, optical model study of, 9: 4604(J)
scattering by nucleons, fourth-order corrections to, in pseudoscalar meson theory, 9: 1662(J)
scattering by nucleons and photomeson production, 9: 2044(J)
scattering theory, field equation cut-off method, 9: 7481(J)
stability and decay of heavy, in nuclear emulsions, 9: 5744(J)
statistical analysis of, formed by nuclear disintegrations in photographic emulsions, 9: 6426(J)
stopping and mass of heavy, 9: 1335(J)
stopping of heavy negative, in nuclear emulsions, 9: 328(J)
systematization of heavy, and hyperons, 9: 1623(J)
theory of, and experimental work on, book, 9: 6745(J)
theory of pseudoscalar coupling, 9: 1144(J)
unstable, mean-life determinations of, from cosmic radiation, 9: 1009(J)
unstable heavy, probability of decay in flight in photographic emulsion exposed at high altitudes, 9: 1294(J)
Mesons (δ)
formation and decay scheme, 9: 3961(J)
production from π^--p scattering, 9: 1666(J)
decay and spin, 9: 3273(J)
Mesons (δ^0)
decay, angular distribution between π^+ and π^- mesons in, 9: 4259(J)
decay, charge conjugation in, 9: 3702(J)
mean lifetime estimate, 9: 3606(J)

Mesons (θ^0) (cont'd)

production in $\pi^- - p$ collisions at 1 Bev, 9: 5461(J)

Mesons (θ^+)

identification of, 9: 6035(R)

Mesons ($\theta^\pm$)

cloud chamber investigations and summary of properties, 9: 4858

Mesons (K)

beta decay, 9: 6740(J)

beta decay of, and classification of decays of, and masses, 9: 7474(J)

capture, six-branch star produced by, 9: 6433(J)

capture of negative, 9: 4262(J)

decay, 9: 3961(J)

detection of, from Bevatron using strong-focusing spectrometer, 9: 6023(J)

evidence for existence of, 9: 5745(J)

gamma stability of, 9: 7088(J)

mass, 9: 7089(J)

mass, measurement of, by application of photometric ionization measurement, 9: 6727(J)

nuclear capture of, characteristics of interactions produced by, 9: 6426(J)

nuclear interactions, 9: 3960(J)

photons in decay products of, confirmation of, 9: 6021(J)

Mesons (K^+)

capture stars, 9: 7092(J)

mean lifetime, 9: 7479(J)

Mesons (Λ)

occurrence of 5-bev, at 24,000 m, 9: 4543(J)

production from $\pi^- - p$ scattering, 9: 1666(J)

Mesons (Λ^o)

decay, 9: 1335(J)

decay and excited states, 9: 1622(J)

production in pion-nucleon or nucleon-nucleon interactions, 9: 1986(J)

Mesons (μ)

absorption of cosmic, in Sb, Sn, Cu, Cd, Pb, Hg, Mo, and Ag, 9: 721

beta decay of, preliminary data on, 9: 7081(J)

binding energy of, 9: 6751(R)

capture of, transition probability for, in terms of electric charge distributions, 9: 1068(J)

Cherenkov and isotropic radiations from single, in air, 9: 6427(J)

decay, radiative corrections to, 9: 2435(J)

electromagnetic interactions of, energy effects in, 9: 5136(J)

electromagnetic interactions with electrons, 9: 2882(J)

excess of positive over negative, at high energy, 9: 1060(J)

experimental results on, discussion of, 9: 6431(J)

incoherent scattering cross sections of high-energy, by nuclei $Z \leq 20$, 9: 5795(J)

interactions of fast, in production of penetrating secondaries, 9: 326(J)

ionization energy losses of fast, at high gas pressures, correlation with Landau distribution, 9: 2489

ionization loss of relativistic, in neon, 9: 7883(J)

ionization of gases by, 9: 3959(J)

large angle scattering of, in Fe, 9: 3322(J)

from π-meson decay, electron pair associated with, 9: 7091(J)

meson decay life of positive and negative, 9: 2436(J)

multiple scattering of slow, by constant sagitta method, 9: 4861(J)

non-mesonic photonuclear reactions initiated by, 9: 7884(J)

observation of, from K-particle decay, 9: 6430(J)

positron spectrum, 9: 6035(R)

positron spectrum from decay of, 9: 2890(R)

Mesons (μ) (cont'd)

production of pairs in Be and Al by 345-Mev bremsstrahlung, 9: 1316(J)

production spectra in atmosphere, 9: 1298(J)

scattering by nuclei, magnetic effects, 9: 1109(J)

secondaries in penetrating showers produced by, counter arrangements for, 9: 6432(J)

secondary electron production by high energy, 9: 5130(J)

size-frequency distribution of ionization bursts from, in A-filled 8-inch diam. spherical ion chamber, 9: 4490

star production by, 9: 5740(J)

x rays from C produced by, proportional counter detection of, 9: 7870(J)

Mesons (μ^-)

decay, cloud chamber study, 9: 4253

internal pair production from slow, in H, 9: 5459(J)

mass of, from precision π^- mass determination and previously measured $\pi^- - \mu^-$ mass difference, 9: 338(J)

production and radiochemical analysis of beams of, 9: 1057(J)

Mesons (μ^+)

mass of, from precision π^- mass determination and previously measured $\pi^- - \mu^-$ mass difference, 9: 338(J)

Mesons (π)

absorption by heavy nuclei, 9: 1385(J)

attenuation length in air, relation to positive temperature effect in cosmic radiation, 9: 6347(J)

beta decay, attempt to find, 9: 4254

bremsstrahlung production by collisions with nuclei, 9: 7487(J)

collisions with nucleons, γ rays from, 9: 2032(J)

Coulomb interference in pion-proton scattering at 120 Mev, 9: 5765(J)

decay, π-μ, with an associated electron pair, 9: 7091(J)

decay of H_Λ^4 nucleus by, 9: 7090(J)

double and single production at 1000 Mev, perturbation calculation for, 9: 723(J)

double production of, in nucleon-nucleon collisions, 9: 5750(J)

energy ratio of neutral to charged, in cosmic radiation, 9: 7040(J)

fission of U by slow, 9: 6771(J)

formation by collision of nucleons at near threshold energy, 9: 3958(J)

formation of, cross section relations between processes for, 9: 7969(J)

indirect interactions with nucleons, theory, 9: 7483(J)

interactions in photographic emulsions, 9: 3616(J)

interactions of 4.5-Bev, with protons, 9: 7480(J)

interactions with nucleons, approximate treatment, 9: 2083(J)

interactions with nucleons, Λ^o production from, 9: 1986(J)

interactions with nucleons, review in Annual Review of Nuclear Science, 9: 4008(J)

internal pair production, from radiative capture of, theory, 9: 5469(J)

multiple production by meson-, γ-, and nucleon-nucleon collisions, 9: 2009(J)

multiple production of, in pion–nucleon collisions at 1 bev, analysis with statistical theory, 9: 793(J)

in nuclear emulsions produced by 950-Mev protons, 9: 7542(J)

nucleon scattering, model for, 9: 6449(J)

nucleon scattering, pseudoscalar theory applied to, 9: 7213(J)

nucleon scattering by, d-wave phase shifts of, 9: 7204(J)

pair formation ($\pi^\pm$) in nuclear emulsion, 9: 4256(J)

photoproduction (at 270 Mev) of, from deuterium, 9: 6019(J)

photoproduction cross sections, calculation from nuclear isobaric states, 9: 2883(J)

photoproduction cross sections in deuterium, 9: 6017(J)

photoproduction in He, 9: 7079(J)

photoproduction of, cross sections, excitation curves, and momentum distributions of, 9: 6736(J)

Mesons (π) (cont'd)
photoproduction of, matrix elements for double, 9: 327(J)
produced in meson-nucleon reactions, 9: 5749(J)
production, role of isobaric states of nucleons during, 9: 7489(J)
production and scattering of, in region 380 to 660 Mev, 9: 7908(J)
production by neutrons on C and H, 9: 6737(J)
production by neutrons on He, 9: 3954
production by protons and photons, 9: 2890(R)
production by 657 Mev protons on C and H, 9: 6737(J)
production by 0 to 250 Mev γ quanta on D, cross sections and energy distribution, 9: 6012(J)
production in n-p collisions, differential cross sections and energy spectra, 9: 5458(J)
production in nucleon-nucleon and nucleon-nucleus collisions, 9: 7100(J)
production of heavy unstable particles by 1.37-Bev, 9: 4257(J)
production processes, theory, 9: 7485(J)
production spectra in atmosphere, 9: 1298(J)
proton scattering, energy dependence of phase shifts in, 9: 5449
quasi-bound states of pion-nucleon system in Tamm-Dancoff approximation, 9: 7215(J)
range-energy and energy-momentum relations, tables, 9: 402
range-energy relations of, in nuclear emulsions, 9: 3939(J)
ratio of charged to neutral, in high-energy interactions, 9: 6013(J)
ratio of positive to negative, in cosmic particle reactions, 9: 7471(J)
from reactions γ + D, differential cross sections for, 9: 6450(J)
reactions of stopped, in hydrogen and deuterium, 9: 5448
scattering by deuterons, multiple-scattering corrections to the impulse approximation for, 9: 7080(J)
scattering by heavy nuclei in nuclear emulsions, theory of, 9: 1142(J)
scattering by nucleons, 9: 2034(J)
scattering by nucleons, theoretical analysis of, 9: 329(J), 403(J), 722(J)
scattering by nucleons in Tamm-Dancoff approximation, 9: 4650(J)
scattering by protons, tables, 9: 2930
scattering by unpolarized nucleons, invariant transformation cross sections in, 9: 7205(J)
scattering cross section of, for protons, second maximum in, 9: 7085(J)
scattering in nuclear emulsions, 9: 777
scattering of 160-Mev, by protons in nuclear emulsions, 9: 1108
scattering phenomena, photoproduction, electron production, cross sections, and pair production, review of, 9: 6753(J)

Mesons (π^-)
angular distribution between π^+ mesons and, in δ^0 decay, 9: 4259(J)
capture by U, Bi, and W, fission and star formation yield, 9: 7473(J)
Čherenkov radiation from, measurement, 9: 5429(J)
elastic scattering of π^- mesons by H at 15 Mev, 9: 5739
fission of U, Bi, and W by, and star formation, 9: 6436(J)
fission of U, Bi, and W by, probabilities and mechanism of, 9: 7935(J)
fission of U by slow, 9: 6739(J)
fission of U, Pb, and W by slow, 9: 6738(J)
inelastic scattering of 300-Mev, on complex nuclei, 9: 7078(J), 7882(J)
interaction of 140- to 400-Mev, with D, total cross section, 9: 7077(J), 7881(J)
interactions with protons at 1.4 bev, 9: 2940(J)
internal pair production from slow, in H, 9: 5459(J)
mass, precision measurement from radiative absorption in H, 9: 338(J)
nucleon collisions at 1.5 Bev, 9: 5525(J)
produced by neutron bombardment of deuterons, 9: 2914
production (π^+/π^-) ratios from C by 310-Mev, 9: 2434(J)
reactions with protons at 1 Bev, $\Lambda^0-\delta^0$ production from, 9: 5461(J)

Mesons (π^-) (cont'd)
rest mass, 9: 1985(J)
scattering by protons with heavy-particle production, 9: 1666(J)
scattering from D at 119-Mev, angular distribution, 9: 2488(J)

Mesons (π^0)
decay of, energy distribution of γ rays from, 9: 6020(J)
elastic photoproduction of, in He, 9: 7977(J)
formation by 670-Mev proton reactions, relation to absorber atomic weight, 9: 3607(J), 5453(J)
gamma decay of, damping effect in, 9: 336(J)
identification of, in $K_{\pi 2}$ decay, 9: 5462(J)
internal pair production from decay of, theory, 9: 5460(J)
life of, radiation corrections in, 9: 332(J)
lifetime, effect of anomalous nucleon magnetic moment on, 9: 4544(J)
lifetime and π^0/charged particle ratio from analysis of 3×10^{13} ev cosmic shower, 9: 1927(J)
mass of, from precision π^- mass determination and previously measured π^--π^0 mass differences, 9: 338(J)
photoproduction (at 250 to 300 Mev) from deuterium, differential cross section for, 9: 6018(J)
photoproduction by 250-Mev γ rays on D, 9: 6742(J), 7470(J)
photoproduction from protons at 170 to 340 Mev, 9: 1987(J)
photoproduction in H, differential cross sections from 180 to 215 Mev at 135°, 9: 4261(J)
photoproduction in nuclear emulsions and C, 9: 1066(R)
photoproduction of, distribution in, theoretical calculations, 9: 1984(J)
photoproduction of, in H_2, 9: 3609(J), 3610(J)
photoproduction total cross sections from threshold to 240 Mev in H, 9: 4260(J)
production by 400-Mev neutrons, cross sections for Be, C, Al, Fe, Cu, Sn, and Pb, 9: 5742(J), 6011(J)
production by 400-Mev neutrons on H and D, 9: 5743(J)
production of, in n-p collisions, 9: 784(J)
radiation process $\pi^0 \rightarrow 2\gamma$, non-gauge term in, 9: 5827(J)
ratio of, to charged particles in cosmic showers, 9: 5904(J)

Mesons (π^+)
absorption reactions ($\pi^+ + d \rightarrow p + p$) at 76 and 94 Mev, cross sections, 9: 424(J)
angular distribution between π^- mesons and, in δ^0 decay, 9: 4259(J)
Čherenkov radiation from, measurement, 9: 5429(J)
formation in p(p,π)d reaction at 460 Mev, 9: 3605(J), 4287(J), 4571(J)
formation in p(p,π)d reaction at 510 to 660 Mev, 9: 3606(J), 5452(J)
formation of, from interaction of polarized protons, 9: 790(J)
multiple Coulomb scattering and residual range in nuclear emulsions, relation between, 9: 4306(J)
photoproduction from hydrogen, deuterium, helium, and carbon, 9: 4859
photoproduction from H near threshold, 9: 4258(J)
photoproduction in hydrogen, 9: 1066(R)
photoproduction of, in H gas by 230- to 450-Mev photons, 9: 6015(J)
photoproduction of, in H gas by 500-Mev bremsstrahlung, 9: 6014(J)
production by 500-Mev electrons on Li, 9: 4545(J)
production from C by 310-Mev bremsstrahlung, 9: 2434(J)
production from p-p interactions, 9: 3652(J)
production of high-energy electron pairs by, in nuclear emulsion, 9: 1664
from proton reactions $p + p \rightarrow \pi^+ + d$, angular distribution and total cross section, 9: 5789
scattering and absorption in lead, 9: 2929
scattering and Coulomb interference of 113-Mev, with protons, 9: 1337(J)

Mesons (τ)
analysis of, found in nuclear emulsion, 9: 6429(J)
competition between decay and capture of, 9: 7972(J)
decay, 9: 7084(J)
decay of, angular correlations, 9: 4542(J)
decay of, in nuclear emulsions, 9: 725(J)
disintegration analysis, 9: 5450
production processes, theory, 9: 7485(J)
properties of, 9: 6035(R)
review of, in Annual Review of Nuclear Science, 9: 3957(J)

Mesons ($\tau^{\pm}$)
similarity to V_2^0 particles, 9: 334(J)

Mesons (τ^-)
capture by nucleus (τ,π), 9: 7488(J)

Mesons (τ^+)
decay in flight, 9: 4255(J)

Mesons (χ)
mass from observation in nuclear emulsion, 9: 4834(J)

Metabolism
(See also appropriate subheadings under specific materials and organisms; see also Animal metabolism; Basal metabolism; Plant metabolism.)
carbohydrate, in animals studied by C^{14}, 9: 7664(J)
in chick embryos, effects of radiation, 9: 4691
effects of radiation on, in eggs and embryos of grasshoppers, 9: 495(J)
effects of thyroidectomizing doses of At^{211} and I^{131} on, in rats, 9: 5574(J)
effects of total-body irradiation on, in mice and rats, 9: 6154(R)
effects of x rays on, of radioactive glutathione in mice, 9: 15
of formates and carbonates by normal and irradiated chick embryos, tracer study, 9: 3376
of glucose in virus-infected mice, 9: 6863
of glycogen, effects of irradiation on, in rats, 9: 7233
of inhaled carbon in rats, tracer study, 9: 2611(J)
of injected lipoprotein, in normal and irradiated rabbits, 9: 5839
of iodine by thyroid gland, effects of dietary fluorine, tracer study, 9: 2610(J)
of iron, effects of total-body x irradiation on, in duck erythrocytes, 9: 2580(J)
of iron by erythrocytes in bone marrow, 9: 3007
of lipoproteins, effects of massive doses of x radiation on, in dogs, 9: 5573
of lipoproteins, effects of radiation on in rabbits, dogs, rats, and mice, 9: 3009
of lipoproteins, effects of total-body x irradiation on, in rabbits, 9: 1446
in liver, effects of whole-body irradiation on in rats, tracer study, 9: 7234
measurement, in humans, equipment for tracer study, 9: 2136(R)
in normal and leukemic leukocytes, enzymatic factors, 9: 6
of purines, in normal and neoplastic tissues, tracer study, 9: 6594(J)
research in, tracer applications, 9: 7666(J)
role of, in oxygen effect in x-irradiated bacteria an yeasts, 9: 24(J)
of sulfanilamide and phenolic compounds, effects of total-body irradiation on, in guinea pigs and rats, 9: 480(R)

Metabolism cages
for exposure of small animals to radon atmosphere, design, 9: 1728

Metal coatings
(See also appropriate subheadings under specific metals; see also Coatings.)
corrosion resistance of, to UF_6 and other halides, 9: 7992(P)

Metal coatings (cont'd)
fused-in-place spray, preparation, metallurgical nature, and applications, 9: 4194(J)
fused self-fluxing, practical hard facing with, 9: 3529(J)

Metal complexes
structures and reactions, 9: 7714(J)

Metal couples
(See also Ceramic–metal couples.)
bonding and electric properties, 9: 3523

Metal crystals
(See also Alkali metal halide crystals.)
determination of substructures in metal single crystals by means of x-ray, 9: 4816(J)
internal friction, 9: 5054
plastic deformation in, effect of size on, 9: 7834
precipitation in plastically deformed, 9: 5068
properties, theoretical analysis, 9: 3908(J)

Metal-foil detectors
indium, performance for neutron monitoring, 9: 6401
neutron flux depression, 9: 3291(J)

Metal–gas systems
bibliography, 9: 963

Metal halides
anhydrous, synthesis, 9: 4974(J)

Metal ions
distribution of, between melts and solid phases, 9: 6554(R)

Metal powders
(See also specific metal powders.)
preparation by electrolysis of fused salts, 9: 2744(J)
sintering and annealing, 9: 1891(J)
vapor coating with radioactive materials, process for, 9: 5555(P)

Metal systems
(See also Gas–metal systems.)
thermodynamics of, electrochemical techniques in, 9: 7674

Metallic films
(See also headings for foils or films identified by material; see also Coatings; Metal coatings.)
bibliography on preparation and properties, 9: 4930
evaporated thin, structure of, 9: 5672(J)
surface area of Ni, Fe, Rh, Mo, Ta, and W, measurement, 9: 3887(J)
x-ray-diffraction analysis of surface properties, 9: 186

Metallic foams
formation of low-density, for sandwich construction, methods and equipment for, 9: 3181
formation of low-density core material of Al–Mg alloy, for sandwich construction, design of equipment for, 9: 3182

Metallic foils
electron energy losses in thin, 9: 5790

Metallography
apparatus for electropolishing specimens, 9: 2328(J)
equipment modification for remote operation, 9: 2194
etching and polishing procedures for W and Mo, 9: 1865(J)
etching of steel by ionic bombardment, 9: 1280(J)
remote equipment for high-activity, 9: 562(J)
sample preparation, procedure and equipment for, 9: 563(J)
sample preparation, use of ultrasonic cleaning in, 9: 567(J)
universal polishing method, 9: 3879(J)
use of N. H. P. mounting plastic in, 9: 149(J)

Metallurgical Advisory Committee on Titanium

progress reports on Ti research and development, 9: 2730

Metallurgical equipment

mist cooling in machine tool practice, health hazards, 9: 2723

Metallurgical Labs., Dow Chemical Co.

(See Dow Chemical Co. Metallurgical Labs., Midland, Mich.)

Metallurgical Labs., Sylvania Electric Products, Inc.

(See Sylvania Electric Products, Inc. Metallurgical Lab., Bayside, N.Y.)

Metallurgy

(See also subheadings under specific materials; see also Electrometallurgy; Powder metallurgy; Tracer techniques (metallurgy).)

applications of radioisotopes in studies of, conference, 9: 3807(J)

cold-working, deformation faults in, 9: 2778(J)

electron-optical methods in constitutional, 9: 2327(J)

power requirements in extrusion and punching, theoretical determination, 9: 4193(J)

progress in metal physics, 9: 2305(J)

of radioactive materials, laboratory design, 9: 575(J)

review of nonferrous, 9: 4200(J)

summaries of research projects in, 9: 6288

techniques of fiber, 9: 3538(J)

Metallurgy conferences

meeting of Metallurgy Development Advisory Committee, AEC, on Zr-base alloys, 9: 7003

Metals

(See also specific metals, alloys, etc.)

active, purification of rare gases by, 9: 2382

adhesive bonding of, ultrasonic inspection, 9: 1263(R)

adsorption and exchange in metal-metal ion systems, review, 9: 121(J)

adsorptive beginning of corrosive fatigue of, 9: 4811(J)

analysis, electronics in direct reading spectrometers for, 9: 3948(J)

angular correlation of photons from annihilation of positrons in, 9: 6766(J)

annealing of cold-worked, 9: 980(J)

atmospheric corrosion and storage, 9: 3824

bibliography on the determination of thermal conductivity of, at elevated temperatures, 9: 1535

bonding, 9: 3523, 4114(R)

bonding in, testing, 9: 5363(J)

bonding with glass, theory, 9: 6646(R)

brittleness and plasticity of, new criterion for, 9: 1867(J)

chemical polishing of Zr, Hf, Ti, Pb, and Sn, 9: 7990(P)

chromatographic microseparation of U(VI) ions from, tracer study, 9: 5267(J)

coating by dispersion of Ti and metal sheets in close proximity in fused salts, 9: 2307(J)

coefficients of surface diffusion of, 9: 5658(R)

cohesive forces in, and magnetic properties of, quantum theory of, 9: 6553(J)

compressibility parameters and Grüneisen's constants, 9: 1863

corrosion, development of oscillating furnaces for testing, 9: 6649(J)

corrosion by liquid NaOH at 1000 and 1500°F, 9: 1508

corrosion resistance and applications of construction, survey and directory of, 9: 137(J)

corrosion resistance of coatings, 9: 7992(P)

cost ratings of various, 9: 2254(J)

creep, effects of high temperature on, 9: 5358

creep properties of, under intermittent stressing and heating conditions, 9: 3521

cutting and welding underwater, manual on, 9: 6331(J)

Metals (cont'd)

derived equations of state for, from shock wave measurements,

determination of O_2 in, 9: 5609(J)

diffraction and inelastic scattering of 10^2 to 2×10^3 ev electrons, 9: 263(J)

diffusion and oxidation of, review, 9: 3206(J)

diffusion and self-diffusion in, tracer study, 9: 7807(J)

diffusion coefficient, measurement with radioactive isotopes, 9: 7802(J)

diffusion in, determination by β-emitting tracers, 9: 5670(J), 7795(J)

dissolved in NaF–KF mixture, relative position in the electrochemical series of, 9: 6310(J)

effects of radiation on and corrosion problems with, in reactors, general discussion of, 9: 6483(J)

electron emission, effects of radiation on, 9: 3208(R)

electrode potentials of, in molten salts, 9: 522(J), 7006(J)

electron emission from freshly worked surfaces, 9: 7423(J)

electrons emitted from, after irradiation by 1.5-Mev x rays, 9: 5183(J)

energy loss of 22-kev electrons, 9: 1665(J)

energy storage in, due to α bombardment, 9: 4995

erosion of, by spark discharge, 9: 6357(J)

extension of Matthiessen's Rule to cold-worked, 9: 1536(J)

extrusion and punching, power requirements in, theoretical determination, 9: 4193(J)

extrusion of light and ferrous, ingot container for, 9: 6294(J)

fatigue fracture of, theory, 9: 4814(J)

fatigue on, apparatus for testing, 9: 4987

fatigue strength, 9: 5060

field-emission microscopy, 9: 2741

film formation, mathematical analysis, 9: 3884(J)

freshly formed surfaces of, reactivity, 9: 3542(J)

friction-tinning soldering technique for, 9: 7818(J)

galling and seizing, in prevention of, 9: 2745(J), 2746(J)

high temperature corrosion, review, 9: 4443(J)

interdiffusion of, pores formed during, 9: 5362(J)

intergranular oxidation, 9: 4185

internal defects, determination of, by γ rays, 9: 7804(J)

irradiation disordering of, mechanism, 9: 4012(J)

isotopic migration and selfmigration in, 9: 1954(J)

mechanical properties, effects of H_2 at high pressures on, 9: 5376(J)

metallographic etching, mechanisms of, 9: 646(J)

methods for etching, of W and Mo metallographic specimens, 9: 1865(J)

microstructure under varying stress, equipment for examining, 9: 5971(J)

molecular theory, 9: 4479(R)

multistage batch separation by zone melting, 9: 2753(J)

neutron-deficient, radiochemical study, 9: 4864

nuclear magnetic moments, 9: 2895

oxidation and corrosion, effects of alloying elements on, 9: 7011(J)

oxidation of, under conditions of linear temperature increase, 9: 182

paper chromatographic determination of trace, in geochemical ore prospecting, 9: 2264(J)

pile radiation effects on elastic modulus of, method for measurement of, 9: 6509(J)

plastic deformation, coefficient of diffusion in, 9: 7398(J)

plasticity, hardening, and recrystallization, theoretical analysis, 9: 3908(J)

positron annihilation in, angular distribution of γ rays from, and measurement of electron momentum by, 9: 6793(J)

preparation, properties, and treatment, 9: 6288

pressing, evaluation of heat transfer fluids for, 9: 4114(R)

Metals (cont'd)

properties of transition, and their alloys, 9: 979(J)

protective coatings for, book on, 9: 4144(J)

purification by zone melting, design and performance of apparatus for, 9: 1855

quality control by γ testing, 9: 7808(J)

radiation damage, 9: 7155(J)

radiation damage by high-energy particles, theory, 9: 7951

radiation effects from bombardment with 3-Mev deuterons, 9: 7953(J)

radiography, equipment and procedures, manual, 9: 7809(J)

rapid combustion of, in air, a literature survey, 9: 3178

rare, handbook on, 9: 2245(J)

reflection of monochromatic waves from, in a constant magnetic field, 9: 6680(J)

remote polishing and metallographic analysis of irradiated, 9: 562(J)

remote sampling by electrolytic drilling, apparatus and procedure, 9: 3862

scaling of, kinetics, 9: 636

shock wave separation into elastic and plastic components in, techniques for observing, 9: 3903(J)

size of interstitial solute atoms in close-packed, calculated from observed α-ray lattice expansion data, 9: 1780(J)

solid-state diffusion bonding by pressure welding and electrolytic deposition of Ti as an adherent layer on, 9: 3477(R)

solubility in liquid metals, equipment and procedures for studying, 9: 3501

sputtering in, radiation damage theory, 9: 3898(J)

stress-corrosion in, testing, 9: 5321(J)

surface diffusion coefficients, interferometric method for measuring, 9: 3455

surface diffusion in, tracer techniques, 9: 4531(J)

surface tension values for 27, 9: 207(J)

surface wear, effect of coatings on, 9: 4794

thermal conductivity, measurement, 9: 5634

thermal conductivity of, apparatus for measuring, in vacuum at high temperatures, 9: 3554(J)

thermal rupture, effects of atmosphere reaction, 9: 2718

thermal shock, apparatus for testing, 9: 4179(R)

thermalization of positrons in, 9: 4001(J)

thickness and density measurement with radioisotopes, 9: 7805(J)

transfer between electrodes in high vacuum, influence of electric field on, 9: 6696(J)

transition, valence calculations of, 9: 2736

vacancies and energy of vacancy formation in, 9: 3525(J)

vacuum fusion analysis of, for gases, apparatus for, 9: 3406(J)

vapor-pressure determination with radioisotopes, 9: 1883(J)

velocity of evaporation and coefficient of diffusion, measurement by isotopic exchange, 9: 7801(J)

void formation, theoretical analysis, 9: 2330

weld cracking of, literature survey, 9: 1532

wettability of high-energy surfaces, 9: 6596

x-ray analysis of microstructure of, electronic probe for, 9: 5992

x-ray-diffraction analysis of surface properties, 9: 186

x-ray-diffraction studies of, under controlled stress at elevated temperature apparatus for, 9: 277(J)

Metals (liquid)

(See also specific metals and alloys; see also Liquid baths; Reactor fuel alloys (liquid).)

applications in reactor technology, 9: 3643(J)

bibliography of, as reactor coolants, 9: 1080

chemical reactions with water, 9: 4179(R)

Metals (liquid) (cont'd)

circulation and heat-transfer system of graphite-liquid Sn for high temperatures, 9: 139

densities of, measurement at temperatures up to 1000°C, 9: 3386

effects of ultrasonics on, 9: 5065

fluid flow in annuli and heat transfer coefficients between, 9: 6251(J)

handbook on Na and Na-K alloys, 9: 6664

handling of, design, fabrication, operation, and testing of apparatus for, 9: 3443

heat transfer, review of experimental investigations of, 9: 3125

level indicator for, design, 9: 4231

physical properties and use as high-temperature heat-transfer media, applications to nuclear power production and gas turbines, 9: 3443

surface tension of, measurement and calculation, 9: 170

Metals Research Lab., Carnegie Inst. of Tech.

(See Carnegie Inst. of Tech., Pittsburgh. Metals Research Lab.)

Metamorphic deposits (Ariz.)

occurrence in Black Dyke Prospect, 9: 5324

Metamorphosis

of axolotls, effects of age, coloring, and sex, 9: 471(J)

Metatorbernites

occurrence in Austin area, 9: 1257

Metatyuyamunites

occurrence in Sundance formation (Wyo.), 9: 956(J)

Meteorites

absolute geological age, by argon method, 9: 5949(J)

age estimations by Pb^{207}/Pb^{206} method, 9: 4445(J)

age of, by the A^{40}/K^{40} method, 9: 1915(J)

argon isotopes in, relative concentrations, 9: 6340(J)

formation of, time interval between formation of elements and, 9: 6339(J)

isotopic composition of H and C in carbonaceous, 9: 1834(R)

isotopic composition of hydrogen in, 9: 6338(J)

origin and age estimations, 9: 3226(J)

Meteorological instruments

performance, 9: 7492

Meteorology

(See also as subheading under specific sites, installations, and geographic areas; see also Atmosphere; Stack disposal.)

applications of, in atomic energy, 9: 7492

atmospheric turbulence study at Brookhaven Lab., 9: 341

effects of atomic explosions on weather, 9: 1990(J)

effects of thermonuclear explosions on, 9: 3274(J)

experimental stack for study of effects of meteorological conditions on stack disposal, 9: 4263(J)

summary of studies in, at ANL, 9: 6820(R)

Methacrylic acid, methyl ester

methyl radiation polymerization of, 9: 5916(J)

Methacrylic acid, methyl ester polymers

titration, capacity, and swelling, 9: 7311(J)

Methane

adsorption on rutile, 9: 3113(J)

energy required to produce one ion pair, 9: 5702(J)

ion pair formation, 9: 4039(R)

molecular theory, 9: 4479(R)

photoionization efficiencies and cross sections in, 9: 6747(J)

stopping of deuterons in, 9: 5803(J)

yield from decomposition of methanol by Co^{60} gamma radiation and 38-Mev He ions, 9: 2202(J)

Methane (liquid)
solubility of H in, at temperatures from 90.3 to 127.0°K and at pressures from 180 to 230 atm., 9: 341(J)

Methane–argon systems
electron energy lose distribution in, 9: 5698(J)

Methane, bromotrifluoro-
Raman and infrared spectra, 9: 895(J)

Methane–carbon dioxide systems
viscosity of, at 25°C, 9: 3213

Methane, chlorodifluoro-
microwave spectra and dielectric constants, 9: 342

Methane, dichlorodifluoro-
reaction with Te, 9: 3419(J)

Methane, iodo-
microwave spectra, 9: 6437(R)
reaction with pyridine, 9: 2646(J)
Szilard-Chalmers reaction in, temperature effects on, 9: 3093(J)

Methane, nitro-–water systems
mass transfer in a horizontal liquid-liquid extraction tube, properties affecting the film coefficients of, 9: 2208

Methane, trifluoroiodo-
hyperfine splitting of the J = 0 → 1 transition of, 9: 1773(J)
Raman and infrared spectra, 9: 895(J)

Methanes, halo-
boundary lubrication of steel with, 9: 4979

Methanol
adsorption isotherms of, on lampblack, 9: 6683(J)
decomposition of, by Co^{60} gamma radiation and 28-Mev He ions, 9: 2202(J)
solvolysis of $HfCl_4$ and $ZrCl_4$ in, 9: 4967
temperature effects of positron annihilation in, 9: 6792(J)

Methanol–methyl borate systems
electrolytic decomposition, 9: 516

Methanol–water systems
decomposition of, by Co^{60} gamma radiation, formaldehyde and ethylene glycol yields from, 9: 2203(J)

Methanols, triphenyl-
hydrogen exchange between T-labeled, and aliphatic alcohols, 9: 2331(R)

Methionine
biosynthesis of, by A. aerogenes
biosynthesis of, by bacteria, 9: 4911(R)
metabolism of, in chick embryo, tracer study, 9: 2099(R)
oxidation of, in biological systems, hydrogen isotope effect in tracer studies on, 9: 6607(J)
radiation chemistry, 9: 4705(R)

Methyl alcohol
(See Methanol.)

Methyl borate
coordination compound with NH_3, physical and chemical properties, 9: 6881
reaction with B^{10}-enriched boron trifluoride etherate, 9: 3055
toxicity, 9: 4054

Methyl borate–methanol systems
electrolytic decomposition, 9: 516

Methyl radicals
isotopic reaction rates between hydrogen and, 9: 6918(J)

Methylamine
complexes of, with rare earth(III) chlorides, 9: 2667(J)
direct fluorination, 9: 890

Mica
age measurements by Rb^{87}–Sr^{87} method, possible source of error in, 9: 3474(J)
effects of x radiation on electric conductivity, 9: 4620(J)
x-ray absorption, 9: 4524(J)

Mice
care and handling of, during statistical studies of post-irradiation mortality, 9: 6158(J)
effects of continuous γ irradiation on, 9: 6820(R)
effects of γ radiation from atomic bombs on, 9: 5850(J)
effect of x and γ radiation on fertility of, and on viability of their progeny, 9: 7613(J)
lethal dosage determination of radiation for, 9: 1720
lethal effects of radiation, 9: 2567(J)
lethal radiation dosage determinations for, 9: 6155(R), 6836(J)
mange in, control, 9: 2547(R), 4911(R)
metabolism of Te^{132}–I^{132} mixtures in, 9: 3754(J)
newborn, effects of x radiation, 9: 2556(J)
pathological effects of chronic γ irradiation, 9: 2563(J)
radiation damage to, protective action of various substances against, 9: 7637(J)
spontaneous tumors in, a literature survey, 9: 2545(J)
weight of, effects of total-body irradiation on, 9: 477

Michigan. Univ., Ann Arbor. Engineering Research Inst.
progress reports on creep and rupture behavior of Ti and Ti alloys, 9: 2275(R), 2279(R), 3478(R), 3479(R), 7783(R)
progress reports on fatigue properties of Ti, 9: 3842(R)
progress reports on identification of minor phases in heat-resisting alloys, 9: 5952(R)
progress report on influence of surface treatment on fatigue properties of Ti and Ti alloys, 9: 962(R)
progress reports on operation of fission products laboratory, 9: 6507(R)
progress reports on spectrochemical analysis of Ti and Ti alloys, 9: 639(R)
progress reports on study of creep of Ti-75A, RC-130A, and Ti-150A, 9: 168(R)
progress reports on utilization of gross fission products, 9: 1550(R)

Michigan Research Reactor
cost data, 9: 5503(J)
design and hazards evaluation, 9: 4870

Microanalysis
applications of curved-crystal x-ray spectrometers in, 9: 3435(J)

Microörganisms
(See also Bacteria and specific bacteria; see also Protozoa.)
causing spoilage of food, radiosensitivity, review of literature, 9: 2549
life span of experimental, effects of aureomycin, moving and cages on, 9: 3(R)
radiation and heat sterilization of, comparison of, 9: 7617(J)
radiosensitivity, 9: 6155(R)
radiosensitivity of, effects of cell concentration and oxygen tension, 9: 1723(R)
spectrophotometric analysis of, design of cuvettes for, 9: 7693

Microscopes
(See also Electron microscopes; Particle microscopes.)
design of traveling, for measuring photographic plates, 9: 2396(J)
emulsion scanning, design, 9: 2853
interference, techniques for study of surfaces, 9: 669(J)

Microscopy
high-temperature phenomena, heated thermocouple attachment for observation of, 9: 1589
preparation and staining of meiotic material from Lilium anthers for, 9: 6823(J)

Microwave equipment

(See also Electron tubes.)

design and performance of generators and detectors, 9: 6437(R)

fabrication of TiO_2 wave guides for linear accelerators, 9: 1096

refractometer for vapor pressure measurement, 9: 7057

Stark modulation absorption cell for reactive molecules, 9: 1062(J)

for studies of line broadening and dielectric relaxation in compressed gases, 9: 342

Microwave oscillators

design and characteristics, 9: 6807

for generating in the 100 to 1000 micron range, design and performance, 9: 2885(R), 2886(R)

Microwave spectrometers

design and characteristics, 9: 6807

design of simple high-temperature, 9: 343(J)

for detecting radiation in the 100 to 1000 micron range, design and performance, 9: 2286(R), 2885(R)

Microwave spectroscopy

atomic mass determinations by, 9: 729(J)

determination of hyperfine splitting in ground state of atomic H by, 9: 454(J)

of gases, review of recent developments, 9: 3347(J)

review, 9: 3971(J)

Microwaves

generation and transmission, 9: 6437(R)

Mikado Claim (S. Dak.)

uranium and Th distribution, 9: 165(J)

Milk

effects of γ radiation on vitamins and enzyme activity in, 9: 4919(J)

Miller House Area (Alaska)

geology, 9: 628(J)

Mine Safety Appliances Co., Callery, Penna.

progress reports on Na heat transfer systems, 9: 6953(R)

progress reports on radioactive leak experiment, 9: 6678(R)

Mine Safety Appliances Co., Pittsburgh

progress reports, 9: 4175(R), 5657(R), 6999(R)

progress reports on liquid metal technology, 9: 4179(R)

progress reports to Detroit Edison Co., 9: 1897(R), 1898(R), 1899(R), 1900(R), 1901(R), 1902(R), 1903(R), 1904(R)

Mineral deposits

occurrence in Wyo., N. Mex., Utah, and Colorado, 9: 5948(R)

Mineral Point Area (Alaska)

exploration, 9: 628(J)

Minerals

(See also Radioactive minerals; Rare earth minerals.)

age determination by potassium-argon decay, 9: 625(J)

age determination of, from Boulder Batholith and other batholiths of Western Montana, 9: 4444(J)

application of election microscopes to study of, 9: 3830(J)

dating of, by determination of ratio of A^{40}/K^{40}, 9: 3463(J)

determination of Th and Ra contents of, with proportional counters, 9: 957(J)

flotation, theoretical analysis of, 9: 148(J)

potassium age determinations of, by neutron activation analysis, 9: 2713(J)

volumetric analysis for U in complex, 9: 542(J)

Minerals Research Lab., Inst. of Engineering Research, Univ. of Calif., Berkeley

(See California. Univ., Berkeley. Minerals Lab.)

Mining

radon toxicology in deep uranium and non-uranium mines, 9: 6861(J)

Minnesota Mining and Mfg. Co., St. Paul

progress reports on synthesis and evaluation of new polymers, 9: 3083(R), 6210(R)

Minnesota. Univ., Minneapolis

progress reports on geological exploration, 9: 1514(R)

progress reports on mineral deposits in Wyo., N. Mex., and Utah, 9: 5948(R)

progress reports on radiodiagnosis and diagnostic uses of ultrasonics, 9: 6584(R)

Mirrors

coating apparatus, design, 9: 4843

Mitochondria

structure, 9: 4911(R)

structure of, in Paramecium and frog oöcytes, 9: 3(R)

Mitosis

(See also Chromosomes; Genetics.)

effects of irradiation and chemotherapeutic agents on, in rat intestine, 9: 6575(J)

effects of x irradiation on, in Xenopus larvae, 9: 6576(J)

microscopic observations of, in Lilium anthers, preparation and staining of material for, 9: 6823(J)

radioinduced inhibition of, in grasshopper neuroblasts, 9: 7237(J)

Mixers

for preparing accurately blended gas samples, design, 9: 3570

for study of rapid reactions, design, 9: 4956(J)

Mixing

(See also Stirring apparatus.)

of particulate solids, fundamental study of, 9: 1472(J)

statistical analysis, 9: 4824(J)

Moab Bridge Area (Utah)

geology and exploration, 9: 1256

Moab District (Utah)

occurrence of schroeckingerite in, 9: 958(J)

Moab Quadrangle (Utah)

photogeologic map of, 9: 5039(J), 7766(J), 7767(J), 7768(J)

Moenkopi Formation (Utah)

stratigraphy of, in Seven Mile Canyon Area, 9: 6964

Molds

(See also Dies; for biological molds, see Fungi.)

design of, for low-density foamed Al–Mg alloys, 9: 3182

Molecular beams

(See also Ion beams.)

collision alignment of particles in transmitted beam, 9: 5753(J)

focusing for magnetic resonance measurements, 9: 6001

oscillator design, 9: 731(R)

scattering of, from surfaces, 9: 650

Molecular properties

distribution functions in systems with Coulomb forces, 9: 7583(J)

of Li^7F^{19}, by electric resonance molecular beam spectroscopy, 9: 5752(J)

transformation coefficients between LS and jj coupling, tables, 9: 7493

vibrational relaxation times, measurement, 9: 7393

Molecular structure

(See also appropriate subheadings under specific materials.)

analysis by birefringence, 9: 2164

bond length correlations with stretching frequencies in C-O and C-N systems, 9: 6609

computer applications to solutions in theory of, 9: 231(R)

configuration interaction and paired-electron bonds in, 9: 6546(R)

Molecular structure (cont'd)
of cyclopentadienyl-carbon monoxide compounds of V, Mn, Fe, Co, Mo, and W, 9: 6936(J)
determination by x-ray diffraction, 9: 6349(J)
determination of, from the Raman effect, 9: 1339(J)
effect of electrons on, at high pressures, 9: 5697
electronic wave functions of, one-center method of calculation of, 9: 6546(R)
of gases, 9: 342
least-squares calculation of OVFF constants for XY_4 tetrahedral molecules, 9: 7964(J)
quantum theory of, of the triatomic hydrogen complex, 9: 5718
theory, 9: 4479(R)

Molecular weights
of meta-polyphenyls, determination by absorbance, 9: 6925

Molecules
calculation of energy levels for internal torsion and over-all rotation for CH_3BF_2 type, 9: 2438(J)
collisions between diatomic, and atoms, theoretical investigations, 9: 7496(J)
diatomic, atomic polarizations of, theory, 9: 2888(J)
dissociation energies of gaseous, 9: 2437
excitation of, by β decay of a constituent atom, 9: 2995(J), 4101(R)
magnetic properties, spin-spin interaction in, 9: 6438(J)
Monte Carlo calculation of average extension of molecular chains, 9: 2889(J)
scatter of high-energy electrons from diatomic, to simple cubic lattice, 9: 2495(J)
sensitized phosphorescence of organic, at low temperatures, 9: 7495(J)
x-ray intensities in, probability distribution of, 9: 2494(J)

Molybdates
water solubility, hygroscopic deliquescency, room-temperature crystal structure, melting point, weight stability during heating, specific gravity, and number of phases from 0° to 1000°C, 9: 3146

Molybdenites
caustic leaching, ratio of, in temperature range of 100 to 200°C, 9: 2207(J)
preparation of reduced Mo chlorides from, 9: 2223(J)

Molybdenum
absorption of cosmic μ mesons, 9: 721
adsorption of, from HCl and HCl–HF solutions, 9: 6234(J)
adsorption of O_2, H_2, and CO on evaporated films of, 9: 2159(J)
analytical methods for removing impurities in, 9: 633
anisotropy, mechanical properties, effect of MoO_2 and MoO_3 inclusions on mechanical properties, and preparation, 9: 1527(R)
brazing, riveting, and welding, mechanical properties of, 9: 1527(R)
brazing of, for high-temperature uses, 9: 2781(J)
chemical determination of, in Ti and Ti alloys, 9: 4944
compressibility parameters and Grüneisen's constants, 9: 1863
corrosion by Bi–Pb–Sn alloy at elevated temperatures, 9: 6659
corrosion by nitric oxide at high temperature, 9: 6308(J)
corrosion resistance, 9: 6332(J)
creep-rupture strength of, 9: 633
detection of, on Al by colorimetric spot tests, 9: 1196
diffusion of Co in, 9: 1276(J)
ductility, effects of various alloying additions and heat treatments on, 9: 5953(R)
ductility of, factors affecting, 9: 4800(R)
effect on creep and tensile properties of Cr–Fe alloys, 9: 6289
electric excitation energy levels, 9: 4205(R)
electrodeposition, survey, 9: 6283
electrolytic preparation, electrode potentials in, 9: 2147(J)

Molybdenum (cont'd)
electrolytic preparation of, from solution of K_3MoCl_6 in molten alkali halides, 9: 2221(J)
energy levels study by means of electric excitation by protons, 9: 5476(J)
extension of Matthiessen's Rule to cold-worked, 9: 1536(J)
fabrication, mechanical properties, microstructure, and welding of, 9: 974
fabrication of arc-cast, discussion of methods of, 9: 6305(J)
fatigue properties of arc-cast and powder-metallurgy, at room temperature, 9: 2751(J)
film-surface area of evaporated, measurement, 9: 3887(J)
flash welding of, mathematical analysis of temperature distribution during, 9: 5373(J)
flash welds, production and testing, 9: 5371(J)
forging in inert gas, 9: 984(J)
gamma ray yields from Coulomb excitation, 9: 6052(J)
gravimetric determination of, in $MoBr_3$, 9: 2792(R)
improvements in room-temperature ductility of, by various heat treatments, 9: 633
indirect determination by a complexometric method, 9: 3401(J)
initiation of discontinuous yielding in ductile, 9: 633
ion exchange separation of Re from, 9: 1223(J)
mechanical properties and powder metallurgy, 9: 5063
mechanical twinning in, 9: 6299(J)
microstructure of, effect of clamping distance and plates acceleration on, 9: 3531(J)
oxidation, 9: 633
oxidation, ductility, and mechanical properties, 9: 4797(R)
oxidation, kinetics and mechanism of, 9: 6961(J)
oxidation of, under conditions of linear temperature increase, 9: 182
oxidation, protection from, by coating, 9: 7756(J)
oxidation, welding, and mechanical properties of arc-cast, 9: 6304(J)
parabolic flashing of $\frac{1}{2}$ in. sintered-and-wrought, temperature distribution during, 9: 3531(J)
photonuclear reactions, 9: 2449(J)
physical properties for furnace design, review, 9: 1213
polishing and etching of metallographic specimens of, method for, 9: 1865(J)
powder metallurgy and mechanical properties, 9: 2274(R)
preparation, ductility, welding, and spectrographic analysis, 9: 4806(R)
preparation, oxidation, tensile properties, and vacuum fusion analysis, 9: 4798(R); 4805(R)
preparation, properties, and industrial uses, review, 9: 7371(J)
preparation, tensile properties, and vacuum fusion analysis, 9: 4788(R), 4799(R)
preparation and metallurgical properties, 9: 4796(R)
preparation by the bomb reduction of MoO_2, 9: 5676(J)
preparation of, by H_2 reduction of Mo oxides, 9: 633, 4180
production from molybdenites by high temperature-high pressure caustic leaching, 9: 2207(J)
properties and reactor applications, 9: 6476
properties of, 9: 1527
proton range in, 1- to 7-Mev, 9: 6788(J)
proton reactions (p,n), angular distributions and yields at 23 Mev, 9: 4290(J)
radiochemical determination, 9: 876, 2634
repeated arc melting of, under vacuum, 9: 633
separation of, by anion exchange, 9: 912(J)
solid solubility of impurities and their effects on ductility of, 9: 633
solid-state purification of, 9: 633
spectrographic determination of, in ores and rocks, 9: 162

Molybdenum (cont'd)
tensile properties and ductility of as-received and recrystallized, 9: 1848(R)
thermal conductivity and thermal expansion, 9: 1266
vapor deposition of, on Ti and Ti alloys, 9: 2752(J)
welding for heat exchangers, 9: 6661
welding procedures and ductility of weldments of, 9: 633
wetting by liquid Na, 9: 229(J)
wetting with sodium silicate glass, 9: 6646(R)
Molybdenum alloys
casting and forging for gas turbine application, 9: 3869
corrosion resistance, 9: 6332(J)
ductility of, factors affecting, 9: 4800(R)
fabrication of arc-cast, discussion of methods of, 9: 6305(J)
high-temperature strength of, compared with other alloys, 9: 5972(J)
mechanical properties, 9: 2274(R), 4797(R), 5063
oxidation of binary and ternary, 9: 633
powder metallurgy, 9: 2274(R), 5063
preparation, oxidation, and tensile properties, 9: 4798(R), 4805(R)
preparation and factors affecting ductility, 9: 4796(R)
preparation and tensile properties, 9: 4799(R)
properties, 9: 4806(R)
properties and reactor applications, 9: 6476
Molybdenum–aluminum–chromium–titanium alloys
phase structures and tensile properties of as-produced, 9: 2279(R)
Molybdenum–aluminum–cobalt alloys
oxidation at 954°C, 9: 3146
Molybdenum–aluminum alloys
as container material for Ti, evaluation, 9: 4780
crystal structure, 9: 2373(J)
Molybdenum–aluminum–iron alloys
corrosion by water, 9: 6946(R)
Molybdenum–aluminum–titanium alloys
creep and tensile properties of as-forged and heat-treated, effect of structure on, 9: 2279(R)
hardness, crystal structure, and phase studies, 9: 3520
melting techniques and forging temperatures for preparation of, 9: 1850(R)
tensile properties and microstructure, effects of heat treatment at elevated temperature, 9: 2719(R)
Molybdenum borides
reactions with C and N_2, equilibria studies, 9: 5677(J)
refractory properties, 9: 4440(J)
Molybdenum–boron–chromium systems
physical properties, 9: 150(R)
preparation and physical properties of Borolite IV, 9: 7326(R)
Molybdenum bromides
preparation, purification, and analysis of, 9: 2792(R)
Molybdenum–carbon–silicon systems
phase diagrams, 9: 4704
Molybdenum–carbon–titanium systems
forging in inert gas, 9: 984(J)
grain growth and size, microstructure, phase studies, and tensile properties of heat-treated, 9: 975
phase studies and preparation, 9: 5359
Molybdenum–carbon–tungsten systems
preparation and phase studies, 9: 5359
Molybdenum chlorides
preparation of, 9: 2222(J)
preparation of reduced, from molybdenite concentrate, 9: 2223(J)
Molybdenum chlorides (cont'd)
reduction of, to prepare Mo, 9: 633
Molybdenum(V) chlorides
hydrogen reduction of, preparation of Mo by, 9: 1527
Molybdenum–chromium alloys
preparation and physical properties of Borolite IV, 9: 7326(R)
Molybdenum–chromium–cobalt alloys
phase studies at 1300°C, 9: 5070(J)
Molybdenum–chromium–iron–manganese–titanium alloys
mechanical properties and microstructure of extruded and heat treated, effects of temperature, pressure, and die angle on, 9: 2276(R)
Molybdenum–chromium–iron–manganese–titanium–vanadium alloys
heat treatment, mechanical properties, phase studies, tensile properties, and welding, 9: 2298
tensile properties, hardness, and flash weldability, 9: 3856
Molybdenum–chromium–iron–nickel alloys
tensile properties, creep-rupture at 1350 and 1500°F, and microstructure, 9: 3859
Molybdenum–chromium–iron–titanium alloys
tensile properties and ductility, 9: 1848(R)
Molybdenum–chromium–manganese–titanium alloys
microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296
Molybdenum–chromium–nickel alloys
oxidation at 950°C, 9: 3146
weldability of wrought, 9: 3530(J)
Molybdenum–chromium–nickel–tungsten alloys
compressive-stress-rupture properties of high temperature, 9: 3503(R)
Molybdenum–chromium–titanium alloys
ductility, tensile properties, and effects of composition and stabilizing treatments on stability, 9: 5344(R)
mechanical properties, effects of grain size on the, 9: 1837(R)
mechanical properties of, effects of grain size and heat treatment on, 9: 3492(R)
Molybdenum–chromium–titanium boride systems
refractory properties, 9: 4137(R)
Molybdenum coatings
adhesion of vapor-deposited, 9: 4162(R)
Molybdenum–cobalt alloys
creep-rupture strength of, 9: 633
oxidation testing at 940°C, 9: 3146
Molybdenum–cobalt–manganese alloys
oxidation at 940°C, 9: 3146
Molybdenum–cobalt–nickel–tungsten alloys
compression-creep properties, 9: 3504(R)
Molybdenum–cobalt–silicon systems
oxidation at 945 ± 10°C, 9: 3146
Molybdenum fluorides
preparation and purification, 9: 5247(R)
Molybdenum(VI) ions
distribution coefficients between organic solvents and aqueous acids, 9: 6622(J)
Molybdenum–iron alloys
catastrophic oxidation of, effect of Ni and Cr on, 9: 1275(J)
constitution diagrams, creep, hardness, and tensile properties, effects of heat treatment on, 9: 4470(J)
diffusion of Fe in, effect of alloy compositions on, 9: 7794
oxidation kinetics, 9: 1274(J)
Molybdenum–iron–nickel alloys
oxidation at 920 and 1110°C, 9: 3146

Molybdenum–iron–titanium alloys
hardness, heat treatment, mechanical properties, phase studies and welding, 9: 2298

Molybdenum isotopes
Szilard-Chalmers concentration, 9: 1959(J)

Molybdenum isotopes Mo^{90}
decay schemes, 9: 735, 4328(J)

Molybdenum isotopes Mo^{91}
decay schemes and energy levels, 9: 3334(J)

Molybdenum isotopes Mo^{92}
neutron binding energy, 9: 3334(J)

Molybdenum isotopes Mo^{95}
electromagnetic separation and energy level assignment, 9: 7442

Molybdenum isotopes Mo^{96}
energy levels, literature survey, 9: 2068(J)
energy levels, spacings and neutron widths of, 9: 6045(J)

Molybdenum isotopes Mo^{96}
energy levels, spacings and neutron widths of, 9: 6045(J)

Molybdenum isotopes Mo^{97}
energy levels, spacings and neutron widths of, 9: 6045(J)

Molybdenum isotopes Mo^{98}
energy levels, spacings and neutron widths of, 9: 6045(J)

Molybdenum isotopes Mo^{99}
decay scheme, 9: 2071(J)
fission yield of, from U^{235} and U^{238}, fine structure in, 9: 670(J)

Molybdenum isotopes Mo^{100}
double beta or positron decay in, lower limit of half-life for, 9: 6124(J)
energy levels, spacings and neutron widths of, 9: 6045(J)

Molybdenum isotopes Mo^{101}
fission yield of, from U^{235} and U^{238}, fine structure in, 9: 670(J)

Molybdenum isotopes Mo^{102}
fission yield of, from U^{235} and U^{238}, fine structure in, 9: 670(J)

Molybdenum–manganese–nickel alloys
oxidation at 940°C, 9: 3146

Molybdenum–nickel alloys
oxidation kinetics, 9: 1274(J)
oxidation testing at 930, 940, and 945°C, 9: 3146
weldability of wrought, 9: 3530(J)

Molybdenum–niobium alloys
creep-rupture strength of, 9: 633

Molybdenum oxides
electric properties of, for nuclear batteries, 9: 266
heat and free energy of formation, 9: 529(J)
reduction by Ca, 9: 5676(J)
reduction by H_2, 9: 4180

Molybdenum–palladium couples
development of, for high temperature measurements, 9: 185

Molybdenum powders
resistance sintering under pressure, 9: 1878(J)

Molybdenum silicides
corrosion resistance in air, 9: 1248
creep and stress-rupture properties at 1600°F to 2000°F, 9: 1251
fabrication and mechanical and physical properties, 9: 1248
mechanical properties of, influence of carbon content and method of fabrication on, 9: 1250
reactions with C and N_2 at 2000°K, 9: 4704
thermal capacity and thermal conductivity of hot-pressed, measurement of, 9: 1504
thermal conductivity, 9: 946(R)

Molybdenum silicides (cont'd)
thermal conductivity from 300 to 800°C, 9: 1252
thermal-shock resistant properties of, in turbine blades, 9: 1249

Molybdenum steel
embrittlement of, effect of temperature range 1100 to 1150°F, 9: 2758(J)
isothermal embrittlement in, during tempering from 800°F to lower critical temperature, 9: 4188

Molybdenum sulfides
lubricity for high-temperature ball bearings, 9: 1613

Molybdenum–thorium alloys
creep-rupture tests at 1600°, 1800°, and 2000°F, 9: 4799(R)
ductility, effects of various alloying additions on, 9: 5953(R)

Molybdenum–thorium–tungsten alloys
forging in inert gas, 9: 984(J)

Molybdenum–tin alloys
martensitic transformations in, 9: 200(J)

Molybdenum–tin–zirconium alloys
specifications and properties, 9: 5556(P)

Molybdenum–titanium alloys
creep and rupture behavior at 600 to 1000°F, 9: 3483
creep and tensile properties of as-forged, effect of structure on, 9: 2279(R)
creep-rupture strength of, 9: 633
creep-rupture tests at 1600°, 1800° and 2000°F, 9: 4798(R)
ductility, tensile properties, and effects of composition and stabilizing treatments on stability, 9: 5344(R)
forging and ductility of welded specimens, 9: 5953(R)
grain boundary diffusion in, as bonding agent between Ti and steel, 9: 4182
grain growth, effects of dispersed carbides, 9: 3486(R)
grain growth and size, microstructure, phase studies, and tensile properties of heat-treated, 9: 975
martensitic quench products and α' tempering, 9: 1843(R)
mechanical properties, effect of H on, 9: 1857(R)
microstructure of heat-treated, 9: 2275(R)
phase studies and mechanical properties, 9: 1841(R)
plastic deformation and preferred orientation, 9: 1836(R)
precipitation hardening, heat treatment, and embrittlement of high-strength, 9: 4462
preparation, microstructure, phase studies, heat treatment effects, and mechanical properties, 9: 2729(R)
tempering of α' phase in, 9: 1844(R)
tensile properties and microstructure, effects of heat treatment on elevated-temperature, 9: 2719(R)
tensile properties at room temperature, effects of creep test conditions on, 9: 2275(R)

Molybdenum–titanium–vanadium alloys
hardness, influence of cooling rate on, 9: 1842(R)
phase studies, 9: 1844(R)
phase studies and hardness of, cooled by oil, water, and air, 9: 1843(R)

Molybdenum–vanadium alloys
creep-rupture strength of, 9: 633
forging in inert gas, 9: 984(J)

Molybdenum–zirconium alloys
as container material for Ti, evaluation, 9: 4780
creep-rupture, 9: 190
fabrication, 9: 1530(R)
fabrication and tensile properties of, from –195 to 500°C, 9: 3180(R)

Monazites
(See also Thorium ores; Uranium ores.)
age estimation of, from Rhodesia, Manitoba, Madagascar, and Transvaal, 9: 6278(J)

Monazites (cont'd)
chemical processing for recovery of Th, U, and rare earths, 9: 592(J)
electrolytic separation of Th from, 9: 7986(P)
separation of Th from, 9: 5892(J)

Monel metal
(See Nickel alloys.)

Monkeys
care of, in control of tuberculosis and intestinal parasites, 9: 5571
discrimination learning by, 9: 4
effects of localized irradiation of central nervous system of, 9: 7635(J)
lethal dosage determination of radiation for, 9: 1720
lethal effects of radiation, 9: 2567(J)
memory, effects of radiation, 9: 478, 479

Monongahela Formation (W. Va.)
stratigraphy and occurrence of radioactive coal and shale in, 9: 6268

Monsanto Chemical Co., Dayton, Ohio
progress reports on development of high-temperature base stock for hydraulic fluids and lubricants, 9: 4120(R)

Montana
age determination of rocks and minerals in the Boulder Batholith and other batholiths in Western, 9: 4444(J)
coal deposits, map of, 9: 5332(J)
physical stratigraphy of Phosphoria formation in southwestern, 9: 5048(J)

Montana (Beaverhead Co.)
uranium and Th deposits in Deer Creek and Lemhi Pass districts in, 9: 1520(J)

Montana (Jefferson Co.)
exploration of Clancey Mining District in, 9: 1518(J)
geology of the Free Enterprise Mine Area in, 9: 1519(J)

Montana (Madison Co.)
uranium and Th deposits in Melrose District in, 9: 1520(J)

Montana (Silver Bow Co.)
uranium and Th deposits in Melrose District in, 9: 1520(J)

Monte Carlo method
applied to studies of tumor cell populations, 9: 6822(J)
calculation of average extension of molecular chains by, 9: 2889(J)
gamma scattering calculated by, in aluminum and concrete, 9: 6500

Monticello District (Utah)
operating procedures for the U mill in, 9: 5338(J)

Montmorillonites
(See also Bentonites.)
adsorption of fission products on, as waste disposal process, 9: 929(J)
adsorptive properties of, for fission products, 9: 1234
fused, design and fabrication of, in radiation sources, 9: 7060

Monument Mines (Ariz.)
occurrence of navajoite in, 9: 5649(J)

Monument Valley District (Ariz.)
mineral determinations in U deposits and prospects in, 9: 5948(R)
mineralogy, 9: 1829
uranium ore guides for, 9: 6274(J)

Moonlight Group (Nev.)
geology and mineralogy, 9: 6963

Morphine
6-methyl-, synthesis, 9: 4705(R)

Morrison Formation
stratigraphy, 9: 5327(J)

Morrison Formation (Colo.)
geology of, in Horse Range Mesa Quadrangle, 9: 7775(J)
geophysical exploration, 9: 7757

Motors
electroplating of motorettes with Cd and Cr, 9: 1554(R)
preparation for use in high-vacuum systems using oil-diffusion pumps, 9: 4763

Mount Pennell Quadrangle (Utah)
photogeologic map of, 9: 5028(J), 5029(J), 5030(J), 5031(J), 5032(J),

Mount Pisgah uranium deposits (Penna.)
exploration of, in Carbon Co., 9: 164(J)

Mount Taylor Area (N. Mex.)
geophysical exploration, 9: 2709

Mountain Pass District (Calif.)
geology and rare-earth mineral deposits, 9: 3837(J)

Mountain View Property (Alaska)
geology and exploration, 9: 6967(J)

Muddy River Area (Utah)
mineralogy, 9: 1829

Multiplication factor
fast neutron, measurement in U–water lattices, 9: 7929(J)
temperature effects in U–graphite subcritical systems, 9: 7926(J)

Multiplier tubes
(See Photomultiplier tubes.)

Muscles
beef, proteolytic enzyme activity of, effects of γ radiation, 9: 2116(J)
electrolyte retention in, following irradiation, 9: 3032(J)
mechanism of contraction of, role of hydrolysis of adenosinetriphosphate, 9: 473(J)
proteins of spectral properties, effects of adenosinetriphosphoric acid on, 9: 5924(J)

Mutations
enzymatic factors affecting, in E.coli, 9: 6820(R)
induced by radiation in protozoa, 9: 1716(J)
in natural populations of Drosophila, genetic factors, 9: 5(R)
radioinduced, in barley, as a test for physiological effects of radiation, 9: 1159(J)
radioinduced, in Drosophila, 9: 30(J), 3021(J), 3023(J), 3731(J), 4916(J)
radioinduced, in eggs of Habrobracon, effects of oxygen on, 9: 2592(J)
radioinduced, in fungi, 9: 29(J)
radioinduced, in maize, 9: 28(J)
radioinduced, in man, review, 9: 4923(J)
radioinduced, in Mormoniella, 9: 5846(J)
radioinduced, in peanuts, 9: 7628(J)
radioinduced, in plants, 9: 4348(J)
radioinduced, in plants, by exposure of seed to various radiations, 9: 4671(J)
radioinduced, in S. cerevisiae, 9: 5216(J)
sex-linked lethal rates of, induced in Drosophila melanogaster by thermal neutrons, 9: 7631(J)
somatic, produced by chronic exposure to γ radiation in carnations, 9: 4044
x-ray-induced, in Escherichia coli, effect of temperature, 9: 6832(J)

Myton Area (Utah)
airborne radioactivity survey map of, 9: 5046(J)

N

Nabesna Mine (Alaska)
exploration, 9: 626(J)

Nacimiento District (N. Mex.)
geophysical exploration, 9: 2709

Nagasaki
effects of atomic explosions on residents, summary, 9: 3745(J)
residents of, medical effects of atomic bombs on, statistical analysis, 9: 2535
a roentgenographic survey of the skeletal system of children exposed in utero to radiation from the atomic bomb, 9: 6828(J)

Naphthacene
luminescence and absorption spectrum of crystals of, at low temperatures, 9: 7300(J)

1,4-Naphthalenediol, 2-methyl-diphosphate, sodium salts
effects of, on radiosensitivity of E.coli and S.cerevisiae, 9: 5236(J)

Naphthazarin
complexes with rare earths, absorption spectra, 9: 4753(J)

1-Naphthol, 2-nitroso-
separation of Co^{56}, Co^{57}, and Co^{58} from Mn with, 9: 119(J)

Naschitti Quadrangle (N. Mex.)
preliminary geologic map of, 9: 5330(J)

Nathalia Claim (Ariz.)
exploration of, 9: 161

National Bureau of Standards, Washington, D. C.
handbook on marine waste disposal, 9: 604(J)
progress reports on alignment of Ce^{141} and Nd^{147} nuclei, 9: 354(R)
progress reports on development of heat-resistant polymers, 9: 3082
radiation standards produced by, facilities and availability, 9: 2513(J)

National Research Corp., Cambridge, Mass.
progress reports on effects of H, O, N, and C on properties of welds in Ti, 9: 7782(R)

Natural Resources Research Inst., Univ. of Wyo.
(See Wyoming. Univ., Laramie. Natural Resources Research Inst.)

Natural waters
distribution of U-Ra radioelements in, 9: 4438(J)
geochemical exploration for U in, 9: 5326(R)

Naturita NW Quadrangle (Colo.)
geologic map of, 9: 6969(J), 7339(J)

Navajo Mountain Quadrangle (Utah)
photogeologic map of, 9: 5023(J), 5024(J), 5025(J), 5026(J), 5027(J), 6974(J), 6985(J)

Navajo Sandstone (Colo.)
geology of, in Horse Range Mesa Quadrangle, 9: 7775(J)

Navajoites
occurrence in Monument N.2 mine (Ariz.), properties, analysis, and crystal structure, 9: 5649(J)

Naval Research Lab., Washington, D. C.
field facilities for environmental research, 9: 6150
progress reports on engineering physics of dielectrics, 9: 1553(R), 1554(R)
progress reports on nuclear science and technology, 9: 6444(R)
progress reports on properties of molten materials, 9: 634(R), 1466(R), 4367(R), 5078(R), 6875(R)

Nematodes
radioinduced sterility in, 9: 5206(R)

Neodymium
Coulomb excitation of, 9: 2073(J)
energy levels and L absorption spectra, 9: 2899(J)
hyperfine structure, 9: 1686(J)
magnetic susceptibility, 9: 3695(J)
natural radioactivity, 9: 804(J)
paramagnetic resonance absorption spectra, 9: 2075(J)
polarographic studies, 9: 5602(J)

Neodymium (cont'd)
solvent extraction of, into TBP and into a TBP and TTA mixture in kerosene, 9: 906

Neodymium complexes
with cupferron, pyrolysis, 9: 5920(J)

Neodymium compounds
preparation and structure of arsenides, antimonides, phosphides, and nitrides, 9: 5294(J)

Neodymium isotopes
fission yields of, from U^{239}, 9: 7982
relative yields of, from thermal neutron fission of U^{233} and U^{235}, 9: 4656(J)

Neodymium isotopes Nd^{143}
nuclear magnetic moments, 9: 1686(J)

Neodymium isotopes Nd^{144}
energy levels, 9: 1403(J)

Neodymium isotopes Nd^{145}
nuclear magnetic moments, 9: 1686(J)

Neodymium isotopes Nd^{147}
disintegration of, coincidence studies, 9: 3686(J)
nuclear alignment, γ spectra, and magnetic moments, 9: 354(R)

Neodymium isotopes Nd^{150}
beta decay, 9: 6126(J)
beta stability, 9: 1671(J)

Neodymium nitrates
preparation of anhydrous, by reaction of oxides and NO_2, 9: 112(J)

Neodymium oxide–uranium oxide systems
crystal structure and physical properties, 9: 7318(J)

Neodymium oxide–uranium(VI) oxide systems
phase studies, 9: 925

Neodymium oxide–zirconium oxide systems
heat treatment, phase studies, and thermal expansion, 9: 3141(J)

Neodymium sulfates
symmetry of local crystalline field about ions in $Nd_2(SO_4)_3 \cdot 8H_2O$ crystals, 9: 2981(J)

Neon
adsorption on TiO_2, 9: 4366
deuteron stopping in, 9: 5803(J)
electron scattering in, probability of, 9: 7025(R)
energy loss of positive ions scattered in, 9: 1377(J)
gamma reactions, N^{17} yield curve from, 9: 3644
ionic species formed by collision of gaseous ions in, 9: 1378(J)
ionization by α particles and fission fragments, 9: 2821
ionization loss of relativistic μ mesons in, 9: 7883(J)
melting curves for, 9: 6746(J)
solidified, compressibilities at low temperature, 9: 2824(J)
variations in isotopic abundances of, extracted from radioactive minerals, 9: 626(J)
x-ray absorption, 9: 4524(J)

Neon ions
charge distribution of, passing through gases, 9: 5807(J)
collisions with argon, cross section for, 9: 5802(J)

Neon isotopes
positron decay, F^{19} assignments from, 9: 363(J)
thermonuclear reactions of protons with, in stars, 9: 3647(J)

Neon isotopes Ne^{19}
beta decay, electron-neutrino angular correlation in, 9: 2059(J)
beta spectra, 9: 441(J)
shell theory for, and other A = 19 nuclei, 9: 4267(J)

Neon isotopes Ne^{20}

deuteron reactions (d,p), 9: 5153(J), 5781(J)

deuteron reactions (d,p), proton groups from, 9: 3304(J)

energy levels, 9: 1349(J)

scattering of 9.5-Mev protons, 9: 1390(J)

spin and parity assignments of levels of, 9: 6100(J)

ultraviolet spectrum, vacuum wave-length measurements in, 9: 5414(J)

Neon isotopes Ne^{21}

energy levels, 9: 5153(J)

Neon isotopes Ne^{22}

energy levels, 9: 1133, 5781(J)

internal conversion of the 1.28-Mev γ-ray and energy levels of, 9: 1678(J)

Nephelometers

photo-, instrumental variability of model 7 Coleman, 9: 3396(J)

Nephrosis

syndrome of, in children, 9: 2099(R)

Neptunium

radiometric determination, 9: 2634

Neptunium bromides

dissociation pressure in temperature range 224 to 415°C, 9: 6868

Neptunium(V) ions

isotopic exchange reactions with Np^{5+}, effects of $[Cl^-]$ and $[NO_3^-]$ on, 9: 7735(J)

Neptunium(VI) ions

isotopic exchange reactions with Np^{5+}, effects of $[Cl^-]$ and $[NO_3^-]$ on, 9: 7735(J)

Neptunium isotopes Np^{236}

positron emission/electron capture ratio, 9: 5538(J)

Neptunium isotopes Np^{236}

electron spectrum and decay scheme, 9: 7185

long-lived isomer of, formation, beta half life, and fission cross sections, 9: 2055(J)

Neptunium isotopes Np^{237}

decay schemes and nuclear spectra, 9: 4863

level scheme and γ transitions, 9: 6456(J)

neutron fission cross sections for, angular anisotropy of, 9: 6072(J)

nuclear transitions and energy levels, 9: 7906(J)

thermal neutron activation cross sections for sections for and sample preparation of, 9: 6039

Neptunium isotopes Np^{238}

beta decay, 9: 6122(J)

decay scheme, 9: 6123(J)

decay schemes and nuclear spectra, 9: 4863

gamma decay of, relative intensities of 100-kev and 1-Mev peaks in, 9: 61(R)

Neptunium isotopes Np^{239}

beta decay of, Pu^{239} metastable level in, 9: 6125(J)

nuclear spin, 9: 61(R)

nuclear spin from hfs pattern, 9: 360(J)

Neptunium isotopes Np^{240}

half lives, 9: 61(R)

Neptunium(IV) sulfate complexes

thermodynamics of reactions of, 9: 923(J)

Neptunyl ions

electronic structure and magnetic properties, 9: 4035(J)

Nerve cells

of brain, pathological effects of radiation on, in primates, 9: 831(J)

Nerves

of eye, mechanism of response to light and x radiation, in frog, 9: 5214(J)

Nerves (cont'd)

isolated, conduction velocity, effects of radiation on, in bullfrogs, 9: 3727

velocity of conduction in, effects of x radiation on, from frogs and rabbits, 9: 2582(J)

Nervous system

(See also Brain; Nerve cells; Spinal cord.)

central, localized effects of irradiation on, in monkeys, 9: 7635(J)

effects of irradiation of intact spinal cord on, in monkeys, 9: 4354(J)

excitation and inhibition of, radioactive isotope study of biochemical basis of, 9: 7663(J)

radiosensitivity, review, 9: 4355(J)

Network theory

matrix analysis of 4-arm bridges, 9: 4206

synthesis, 9: 7025(R)

Neuromuscular diseases

muscular dystrophy and myotonia dystrophica, exchangeable Na and K in, tracer study, 9: 4696(J)

Neurospora

genetic and non genetic effects of x radiation on, 9: 475

survival and mutations in, following exposure to mixed radiations from nuclear explosions, 9: 826(J)

Neutrinos

angular correlation with electrons in β decay of Ne^{19}, 9: 2059(J)

anti-, detection of, from nuclear reactors by reaction Cl^{37} $(\bar{\nu},e^-)$, 9: 2921(J)

from carbon cycle in the sun, heat production in earth from, 9: 1916(J)

emission from A^{37}, observation with magnetic and electric deflection spectrometry, 9: 2078(J)

magnetic moment, 9: 1352(J)

magnetic moment of, calculations, 9: 2084(J)

neutrino-electron interaction, possibility of, 9: 6006(J)

recoil energies from emission in A^{37}, 9: 1067(R)

Neutron absorption cross sections

of boron, measurement, 9: 3284(J)

measurement in BEPO by pile oscillator method, 9: 694

Neutron activation analysis

(See Radiometric analysis.)

Neutron beams

production of high-energy, by bombardment of C with protons, deuterons, and He^3 particles, 9: 1993(J)

Neutron capture cross sections

binding energy relationship of, in trans-lead nuclei, 9: 6033(J)

measurement by capture-gamma counting, 9: 1073(J)

Neutron choppers

(See Neutron spectrometers.)

Neutron cross sections

data presented at Geneva conference, 9: 7101(J)

inelastic collision, measurement for Mev neutron energies, 9: 5520(J)

measurement of, self-indicating technique for, 9: 988(R)

for reaction $O^{16}(n,\alpha)C^{13}$ as function of neutron energy, and resonances of, 9: 6439(J)

tables and curves of all available data, 9: 7096

Neutron-diffraction analysis

book, principles, techniques, and applications, 9: 6441(J)

data, card punching system for, 9: 5993(J)

modification of commercial x-ray goniometer for, 9: 2413

of single crystals, design of spectrometer for, 9: 6382(J)

Neutron fission cross sections

angular anisotropy of, for U^{233} and Np^{237}, 9: 6072(J)

Neutron fission cross sections (cont'd)
of heavy elements for 120- to 280-Mev neutrons, 9: 5156(J)
for heavy nuclei at high energies, 9: 5778(J)
thermal, of U^{233}, measurement, 9: 6556(J)
Neutron resonance cross sections
many-level formula of theory of, applied to Ag and Au, 9: 6032(J)
Neutron scattering cross sections
correlation to diffraction patterns, 9: 7169(J)
elastic, for 300-Mev neutrons on neutrons, 9: 2932(J)
elastic for, 380-Mev neutrons on protons, 9: 2493(J), 4887(J), 4888(J)
for excitation of low energy γ rays by inelastic scattering, 9: 4205(R)
for low-energy neutron resonances, measurement, 9: 4586(J)
neutron-deuteron differential angular cross sections, 9: 3995
S wave resonances in, variation with A, 9: 7502
Neutron shielding
(See also appropriate subheadings under devices shielded; are also Reactor shielding; Shielding.)
biological effectiveness, 9: 825(J), 826(J)
theory of neutron absorption in Doppler broadened resonances, 9: 1655
Neutron sources
calibration of the NBS Ra–Be standard, 9: 7498(J)
catalog of, 9: 246(J)
design of pulsable, with Cockcroft-Walton accelerator, 9: 3307(J)
distribution of emergent neutrons, 9: 2931(J)
polonium, gamma spectra from, 9: 3929, 4593
polonium–beryllium, calibration, 9: 5427
plutonium–beryllium, spectrum and absolute yield, 9: 4602(J)
preparation, remote-control equipment for, 9: 573(J)
of radium-beryllium, absolute intensity of, 9: 1063(J)
radium-beryllium, design and calibration, 9: 7027
radium–beryllium, yield of, 3958(J)
standard, calibrations of, comparison of, 9: 1064(J)
Neutron spectra
from 200-Mev protons on nuclei, 9: 6035(R)
Neutron spectrometers
crystal, improvements on, 9: 6751(R)
design, performance, and applications, 9: 2854
design and performance of, at Materials Testing Reactor, 9: 5423
design and use of a high pressure proportional counter, 9: 7068
design of, for single crystal analysis, 9: 6382(J)
design of, for time-of-flight measurements, 9: 376
design of BNL neutron chopper, 9: 695
design of 1000-channel, 9: 7449
design of transmission-type bent-crystal, 9: 7862(J)
feasibility of BF_3 proportional counters as, 9: 4535(J)
for measuring intermediate neutron spectra, design feasibility, 9: 5107
operation, 9: 297
proton recoil from fast-neutrons, theory, 9: 6734(J)
time-of-flight for selection of cold neutrons, 9: 3601(J)
triple-coincidence proton-recoil fast, design and performance, 9: 6735(J)
utilizing crystal scattering, design of, 9: 6411(J)
Neutron spectroscopy
principles and applications, 9: 7103(J)
Neutron total cross sections
between 1 and 42 Mev with "strong-coupling" nuclear model, 9: 351(J)
comparison of, with proton total cross sections for light elements, 9: 358(J)
Neutron total cross sections (cont'd)
correction to exponential dependence of neutron transmissions in, 9: 4302(J)
determination of nuclear size from measurements, 9: 5487(J)
for ten elements at 1.4 Bev, 9: 5486(J)
for twelve elements between 60 and 110 Mev, 7124(J)
Neutrons
(See also Cosmic neutrons; Delayed neutrons; Fast neutrons; Thermal neutrons.)
absorption and diffusion in infinite media, 9: 3676(J)
absorption by a small strongly absorbing rod, calculation, 9: 4265
absorption in a semi-infinite region, 9: 5515(J)
absorption in bulk U, 9: 3712(J)
absorption of, in Doppler broadened resonances, theory, 9: 1655
absorption widths in semitransparent nuclear model, calculation, 9: 5155(J)
age and slowing down in hydrogenous moderators, 9: 2927
angular distribution in (n,p) reactions, theory, 9: 2936(J)
angular distribution of, from B^{10} (d,n)C^{11}, 9: 407(J)
angular distribution of, from C^{14}(p,n)N^{14} reaction, 9: 6763(J)
angular distribution of, in first five levels of Be^{10} from Be^9(d,n)Be^{10}, evidence of stripping in, 9: 6454(J)
angular distributions of low-energy, from (d,n) reactions, theoretical analysis, 9: 5504(J)
annealing in LiF crystals irradiated by, 9: 6797(J)
anomalous magnetic moment, 9: 3248(J)
asymmetry in p-n-p double charge-exchange scattering from C and Ta, 9: 7173(J)
attenuation by H_2O from a swimming pool reactor, 9: 7151
attenuation of and dosage from, in water, 9: 6029, 6030
from atomic explosion, late pathological effects on mice, 9: 21(J)
average velocity and spectrum in various media, 9: 7892(J)
capture, circular polarization of γ rays following, 9: 7505(J)
capture and scattering analysis in reactor cores, 9: 346(J)
charge hypothesis isotopic spin relation to, 9: 5139(J)
collision with protons, neutral meson-deuteron production from, 9: 784(J)
continuous absorption, resonance escape probability for, 9: 7066
detection and measurement, circuitry for, 9: 7454(R)
detection and measurement, proportional survey meter for, 9: 306
detection and measurement and nuclear reactions, 9: 1991
detection and measurement by Ge crystals, 9: 1042
detection and measurement of, apparatus, 9: 8015(P)
detection and measurement of, design and performance of U^{233} thermopile for, 9: 4530(J)
detection and measurement of, from proton synchrotron, 9: 2457
detection and measurement of, in reactors, design of ionization chamber for, 9: 3589
detection and measurement of, in the presence of large γ backgrounds, performance of scintillation detectors, 9: 3931(R)
detection and measurement of, instrument for, 9: 716(J)
detection and measurement of, performance of BF_3 proportional detectors, 9: 7451
detection and measurement of, performance of phosphors for, 9: 1601
detection and measurement of, with scintillation detectors, 9: 697
detection and measurement with BNL neutron chopper, 9: 695
detection and measurement with ionization chamber, 9: 318(J)
detection by boron trimethyl counter, 9: 6444(R)
detection by standard and activated LiI phosphors, 9: 3947(J)
detection with BF_3 long counter, 9: 7452
detection with ZnS thin scintillators, 9: 7880(J)
diffusion, iterative scheme for, in reactors, 9: 5716

Neutrons (cont'd)
diffusion calculations of, in reactors, 9: 6062
diffusion in infinite media, "random walk" method applied to, 9: 5463
diffusion lengths, anisotropic, in diffusion theory, 9: 5514(J)
diffusion of, theory, 9: 347(J)
disordering of solids by, theory, 9: 4014(J)
distribution in nuclei, 9: 456(J), 7146(J)
dosage determinations, 9: 3938
dosage determinations for, as a function of linear energy transfer, 9: 6007(J)
dose rate effects on survival of young chicks, 9: 6840(J)
effects of high flux, on thermocouple calibration and thermocouple insulating materials, 9: 429
effects of total-body exposure to, on urine chemistry, 9: 2566(J)
effects on Cu and Al at 80°K, 9: 4622(J)
effects on electrical properties of graphite, 9: 3328(J)
effects on physical properties of Cu, 9: 7568(J)
effects on solutions and complexes of proteins, 9: 7616(J)
effects on x-ray lattice parameters and density of LiF crystals, 9: 1668(J)
eigenvalue problems in transport theory of, 9: 5137
elastic scattering, transformation theory, 9: 417(J)
elastic scattering of, by nuclei in motion, 9: 1115(J)
elastic scattering of 1.92 to 3.84 Mev, by carbon, 9: 3998(J)
emission probability from nuclear reactions in medium weight elements, 9: 7122(J)
energies from tracks in nuclear emulsions, slide rule technique for calculating, 9: 6749(J)
energy-dependent albedo, 9: 4300
energy distribution of, scattered by paramagnetic substances, 9: 6750(J)
energy spectrum of, from $Li^7(d,n)Be^8$ reaction, 9: 6442(J)
energy spectrum of, from nuclear reactor, 9: 1085(J)
exchange scattering of 380-Mev, on deuterons, 9: 3670(J), 4585(J)
fission of U by 14, 180, and 460 Mev, 9: 6771(J)
flux distribution from a thermal-column face, 9: 7531(J)
flux in stratified media, mathematical analysis, 9: 7957
gamma activation of aircraft alloys by, tables for, 9: 6508
group theory with application to inelastic scattering in U, 9: 3963
high-energy (n,p) collisions, phase shift analysis of scattering and polarization of, 9: 6448(J)
induced activity in In foils by effect of orientation on, 9: 2857(J)
inelastic scattering by a monocrystal, discussion of, 9: 6506(J)
inelastic scattering by ferro- and antiferromagnetic crystals, treatment with spin-wave theory, 9: 5792(J)
inelastic scattering in Fe, γ spectra from, 9: 419(J)
inelastic scattering in Li^7, 9: 3320(J)
inelastic scattering of, in Mn, 9: 3319(J)
inelastic scattering of 14-Mev, on C^{12} and O^{16} and resultant γ spectra, 9: 6750(J)
inelastic scattering on F^{19}, up to 2.2 Mev, 9: 7516(J)
interaction with complex nuclei, theory of, 9: 6440(J)
interaction with deuterons, recoil deuterons and disintegration protons from, 9: 2939(J)
interaction with electrons, 9: 5754(J)
interaction with electrons, calculation by meson theory, 9: 7214(J)
interactions in magnetic materials, macroscopic aspects, 9: 1992(J)
interactions with heavy and intermediate nuclei, comparison of experimental and theoretical results, 9: 386(J)
kinetic theory of, 9: 6474
linear extrapolation length of, at surface of imperfectly absorbing cylinder, 9: 3997(J)
magnetic scattering by Zn ferrite, 9: 5805(J)
magnetic scattering of slow, by gaseous O_2, 9: 4587(J)
mass difference of protons and, 9: 732(J)
mass difference of protons and, by difference of electromagnetic self-energies, 9: 352(J)
mass difference theory, 9: 1078(J)
from Materials Testing Reactor, detection and measurement, 9: 2441
mean free path of slow, in nuclei near A = 150, 9: 4313(J)
meson production by, on C and H, 9: 6737(J)
π^0 meson production by 400-Mev, cross sections for Be, C, Al, Fe, Cu, Sn, and Pb, 9: 5742(J), 6011(J)
π^--meson reactions at 1.5 Bev, 9: 5525(J)
migration area in water, 9: 774
Monte Carlo evaluation of single scattering integrals, 9: 2926
multiple scattering of slow, by flat specimens, 9: 5805(J)
multiplication in uranium–graphite systems, 9: 7888(J)
nuclear reactions, application of nuclear optical model, 9: 5157(J)
nuclear reactions (n,γ) in C_3H_7Br, effect of γ radiation on, 9: 5915(J)
optics and physical principles, 9: 2440(J)
penetration in H, 9: 1106
perturbation theory in scattering problems, 9: 5829(J)
from phosphorus (d,n) reactions, energy and angular distributions, 9: 6776(J)
photoproduction in coincidence with protons, 9: 2331(R)
point source of Milne's problem with, 9: 3709(J)
polarization, 9: 1067(R)
polarization and scattering by carbon, 9: 2481(J)
polarization by scattering from O_2 and heavy nuclei, 9: 6031(J)
polarization of high-energy, by scattering from heavy nuclei, 9: 2043(J)
polarization in high-energy scattering, 9: 4311(J)
polarized, production and scattering of, from heavy nuclei, 9: 425(J)
polarized, Stern-Gerlach experiment on, 9: 1658(J)
production by accelerated charged particles, survey of, 9: 1991
production by B(α,n)N reaction, 9: 5799(J)
production by nuclear explosion or cyclotron, a comparison of biological effects on mice, 9: 825(J)
production by proton and deuteron reactions with Be and C, 9: 778
production by 2.2-Bev protons on N and O, 9: 2922(J)
production from electron-bombarded uranium, 9: 3964
production of, with pulse transformer accelerator, 9: 6751(R)
proton recoils from paraffin bombarded paraffin, derivation of equations, 9: 7170(J)
proton total cross sections of, at 206 and 315 Mev, 9: 358(J)
proton scattering by 300-Mev, 9: 7517(J)
protons produced by, escape fraction of protons from photographic plate for, 9: 6034(J)
radiative capture of high-energy, by H, 9: 7517(J)
reaction of 400-Mev, on H and D, π^0 meson production, 9: 5743(J)
reaction of 400-Mev, with protons, π^+ meson production from, 9: 5458(J)
reflection of slow, from NaCl and Be crystal planes, 9: 6027
resonance absorption of U spheres, 9: 3713(J)
resonance absorption in uranium–heavy water systems, 9: 7890(J)
resonance absorption measurements in uranium–graphite systems, 9: 7889(J)
resonances, method for rapid analysis of, 9: 6443(J)
response of skin, 9: 2099(R)
scattering, nuclear model for, in Bi, Ta, In, Fe, and S, 9: 6444(R)
scattering between 0 and 30 Mev, analysis with nuclear complex potential, 9: 5469(J)

Neutrons (cont'd)
scattering by α particles, determination of spin-orbit interaction in, 9: 6795(J)
scattering by deuterons, 9: 2037(J)
scattering by protons, radiation from, 9: 1376(J)
scattering by protons at small angles, 9: 5517
scattering from D and H, angular distributions, 9: 6504(J)
scattering in N^{14}, 9: 1384(J)
scattering of, by phonons and rotons in liquid He II, 9: 6096(J)
scattering of, theory, 9: 2031
scattering of 14-Mev, by optical nuclear model, 9: 2474
scattering of 14.1-Mev, by protons, 9: 2939(J)
scattering of 14.3-Mev, by He^4, 9: 2941(J)
scattering of 91-Mev, by protons, 9: 1392(J)
scattering of 275- to 410-Mev, application of Johnson-Teller nuclear model to, 9: 4608(J)
scattering of 380- to 660-Mev, 9: 7908(J)
scattering of slow, by ortho- and para-H_2, 9: 5791(J)
secondary, dependence of effective number on energy of captured neutrons, 9: 7891(J)
self absorption in absorbers of several geometries in reactor core, analyses of, 9: 6028
self-shielding factors for long hollow cylinders, 9: 2517(J)
single scattering in air, 9: 2028
slowing down, Monte Carlo calculation, 9: 7957
slowing down in reactors, Monte Carlo calculation of, 9: 6444(R)
slowing down of Ra-α-Be, in Fe-H_2O mixtures, 9: 1105
spatial distribution in H_2O and C from a fast neutron source, 9: 411(J)
spin of, from magnetic resonance experiment, 9: 1065(J)
from spontaneous fission of Cf^{252}, detection and measurement, 9: 2452(J)
thermal neutron contribution to fast neutron dose in mice, 9: 2547(R)
thermopile and ionization chamber measurement of, 9: 7070(R)
total scattering cross sections in crystals, interference effects, 9: 2046(J)
transmission, correction to exponential dependence of, 9: 4302(J)
transmission and multiplication in various elements, cross sections, 9: 3646(J)
transport equation solution, 9: 4507
two-group diffusion theory of, applied to reactors with reflectors, 9: 375(J)
widths, size distribution of, 9: 7097(J)
velocity selector for, 9: 8009(P)

Nevada
prospecting in northern, 9: 6963

Nevada (Clark Co.)
exploration of Erie and Arden Area, Goodsprings Mining District, Singer Mine, Vanadium Wedge Mine, and Old Dad Prospect in, 9: 1260(J)

Nevada (Esmeralda Co.)
uranium distribution in Rhyolitic Tuff Deposit in, 9: 1524(J)

Nevada (Humboldt Co.)
exploration of Virgin Valley Opal District in, 9: 1260(J)

Nevada (Lander Co.)
exploration of Austin Area in, 9: 1257(J)

Nevada (Lincoln Co.)
exploration of Atlanta Mine in, 9: 1260(J)

Nevada (Lyon Co.)
exploration of East Walker River Area in, 9: 1516
exploration of West Willys Claim, Silver Pick Property, and Yerington Property in, 9: 1260(J)

Nevada (Nye Co.)
exploration of Henebergh Tunnel Area and Daisy Fluorspar Mine in, 9: 1260(J)

Nevada (Pershing Co.)
exploration of Majuba Hill Mine and Stalin's Present Mine in, 9: 1260(J)

New Mexico
exploration of Datil Area in Catron, San Miguel and Socorro countries, 9: 955(J)
gadolinium minerals distribution in, 9: 7335
mineral association in U deposits, 9: 1829
trace elements reconnaissance in, 9: 2709

New Mexico (McKinley Co.)
preliminary geologic map of Naschitti Quadrangle in, 9: 5330(J)

New Mexico (San Juan Co.)
preliminary geologic map of Kirtland Quadrangle, 9: 5331(J)
preliminary geologic map of Naschitti Quadrangle in, 9: 5330(J)
preliminary geologic map of Ship Rock and Hogback Quadrangles in, 9: 5328(J)
preliminary geologic map of Toadelena Quadrangle in, 9: 5329(J)

New Mexico (Sandoval Co.)
uranium bearing coal and carbonaceous shale in La Ventana Area in, 9: 2263

New York. State Univ. Coll. of Ceramics, Alfred
progress reports on bonding of silicon carbide by metals, 9: 6956(R)

New York Univ., New York
progress reports on fluorescence and conductivity phenomena, 9: 7494(R)

New York Univ., New York. Coll. of Engineering
progress reports on yield point in polycrystalline Ti, 9: 5667

Nichrome
(See Nickel alloys.)

Nickel
absorption of β particles in, and relation to surface counting for diffusion measurements, 9: 4000(J)
adsorption of CO on, 9: 7684(J), 7685(J)
chromatographic determination of, in soil samples, 9: 3404(J)
corrosion by nitric oxide at high temperature, 9: 6306(J)
corrosion in water and aqueous media at 600 and 680°F, 9: 1822
corrosion of, by molten NaOH, effect of mass transfer on, 9: 951(J)
corrosion of, by wet and dry Cl_2 between 260 and 300°, 9: 158(J)
corrosion testing, methods for cleaning exposed specimens for, 9: 952(J)
creep tests on high-purity, 9: 1495(J)
deformed, point defects and release of energy, 9: 3535(J)
density of states curve for, 9: 231(R)
deposition of C and O films on foils of, heated with focused light from 1000-w electric lamp, 9: 242(J)
descaling methods for, corroded by high-temperature water, 9: 154
detection of plating of, through corrosion pits in Al sheaths by colorimetric spot tests, 9: 1196
determination in presence of Fe and Co with dimethylglyoxime, 9: 2167(J)
determination in U by ion exchange, 9: 884(J), 1793(J)
determination of, in high-temperature alloys using anion-exchange separations, 9: 1544(J)
diffusion leak for regulating supply of H_2, 9: 3440(J)
diffusion of gases through, 9: 1577(J)
dissolved in NaF-KF mixture, relative position in the electrochemical series of, 9: 6310(J)
effects of H on, 9: 1272(J)
effect on creep and tensile properties of Cr-Fe alloys, 9: 6289
effects on electrodeposition of, 9: 5053
electrodeposition of, on Nb, 9: 5351
electrodes, electrochemical liberation of O on, 9: 6190(J)
electrolytic polishing of, for removal of layers of Fe, 9: 3874

Nickel (cont'd)
electron emission from, bombarded by hydrogen ions, 9: 250(J)
electroplating and roll-bonding to Ti, 9: 3477(R)
emission of secondary electrons (δ rays) by 1.3-Mev electron bombardment, 9: 1306(J)
extension of Matthiessen's Rule to cold-worked, 9: 1536(R)
film-surface area of evaporated, measurement, 9: 3887(J)
films, sorption of O_2 on, 9: 3112(J)
gamma reactions (γ,p), energy and angular distributions of 21.5 to 28.0 Mev, 9: 5779(J)
heat treatment, inspection, and testing of wrought, 9: 3194(J)
high-temperature scaling, 9: 6261(R)
mass transfer by liquid Na at 400 to 1000°F, 9: 4179(R)
neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)
neutron reactions (n,nγ), γ yields and energies from, 9: 4204(R)
oxidation, effect of Co on high temperature, 9: 5364(J)
oxidation of, 9: 6674(J)
oxidation of, effect of time, temperature, and surface treatment on, 9: 2306(J)
photometric determination of, with ethylenediaminetetraacetic acid, 9: 85(J)
photonuclear reactions, 9: 2449(J)
physical properties, 9: 6281(R)
polarization of, in 3% NaCl solution, 9: 2259(J)
polonium diffusivity into, 9: 6257(J)
properties and reactor applications, 9: 6476
proton scattering by, differential cross sections for, at 5.25 Mev, 9: 7178(J)
quantitative determination of divalent, using a high-frequency oscillator and ethylenediaminetetraacetic acid, 9: 2169(J)
radioactivity induced in by pile radiation, 9: 6105
radiochemical determination, 9: 876
range-velocity relation for fission fragments, 9: 1365(J)
self-diffusion, 9: 3886(J)
slow neutron cross sections, 9: 1391(J)
specific heat of, to 600°C, 9: 185
spectrographic determination in Bi, 9: 1475
spectrographic determination of, in ores and rocks, 9: 162
surface reactions, determined by field-emission microscopy, 9: 2741
thermal conductivity, 9: 989
thermal expansion, 9: 1266
volume and grain boundary diffusion of Sn in, study of by radioautography, 9: 7360(J)
x-ray spectra (soft), 9: 452(J)

Nickel alloys
as brazing alloys, chemical and physical properties, 9: 5066
brazing of Inconel, 9: 5066
casting and forging for gas turbine application, 9: 3869
chemical and physical properties of, for use as high-temperature alloys, 9: 7375(J)
compressive, bearing, and shear creep-rupture properties of, at elevated temperatures, 9: 5361
corrosion by chlorinated and alkalized boiler water and pure deionized water, 9: 3168
corrosion by nitric oxide at high temperature, 9: 6308(J)
corrosion in high-temperature waters, 9: 3459
corrosion in water and aqueous media at 600 and 680°F, 9: 1822
corrosion of grade "A," by alternate exposure to liquid and gaseous fluorine, 9: 4142
corrosion resistance, effect of Mo addition on, 9: 6332(J)

Nickel alloys (cont'd)
corrosion testing, methods for cleaning exposed specimens for, 9: 992
creep, microstructure, rupture, and tensile properties, 9: 2273
creep and fatigue of, effects of grain size on, 9: 4184
descaling methods for, corroded by high-temperature water, 9: 154
electron-diffraction analysis of, for identification of minor phases, 9: 5952(R)
enthalpy and reaction with fused NaOH, 9: 1466(R)
galling of Inconel, 9: 3843(R)
heat-resisting, development, 9: 7377(J)
heat treatment, inspection, and testing of wrought, 9: 3194(J)
physical and magnetic properties, fabrication, and industrial applications, review, 9: 7369(J)
polarization of, in 3% NaCl solution, 9: 2259(J)
properties and reactor applications, 9: 6476
specific heat and enthalpy of Monel, 9: 2308(J)
stress, tensile properties, creep, and relaxation of Waspaloy and Inconel X-550 at elevated temperatures, 9: 7786
stress-corrosion of, in high-temperature water, 9: 4782
tensile properties, effects of temperature on, 9: 5960

Nickel aluminides
metallurgical properties, survey, 9: 3822(J)
refractory properties, 9: 4440(J)

Nickel–aluminum alloys
corrosion-resistant properties in high-temperature water, 9: 6991
high-temperature strength, effects of Mo, $MoCl_2$ and Li on, 9: 3485
microstructure, density, ductility, and stress-rupture, 9: 4166(R)
powder metallurgy and properties, 9: 3485

Nickel–aluminum–aluminum oxide systems
microstructure, density, ductility, and stress-rupture, 9: 4166(R)

Nickel–aluminum–chromium–titanium alloys
surface chemistry of oxidized, 9: 2747(J)

Nickel–aluminum–copper alloys
diffusionless phase transformation, crystal structure, heat treatment, and thermal expansion, 9: 1861(R)

Nickel–aluminum oxide systems
interfacial energy, effect of Ti and Cr additions on, 9: 4777(R)
surface and interfacial energy at elevated temperatures, 9: 7752(R)

Nickel–aluminum–titanium alloys
hardness, crystal structure, and phase studies, 9: 3520
preparation, sintering, density, resistivity, percent O_2, stress-rupture, and impact strength of hot-pressed, 9: 3165(R)
stress-ruptured of sintered, 9: 3850(R)

Nickel–aluminum–zirconium alloys
preparation, density, resistivity, stress-rupture, and transverse rupture strength of hot-pressed, 9: 3165(R)

Nickel–beryllium alloys
alloying effect of Be on properties of, 9: 982(J)

Nickel–boron–chromium–iron systems
preparation, casting into ingots, and fabrication into strips, 9: 6994

Nickel–boron–chromium systems
hardness measurements, 9: 3822(J)
neutron irradiation effects on precipitation hardening reaction, 9: 5382(R)
properties of, as high-temperature brazing alloy for thin sheet metals, 9: 1886(J)

Nickel–calcium alloys
crystal structure, 9: 683(J)

Nickel–carbon–iron systems
coefficient of self-diffusion of Fe in, 9: 5067(J)

Nickel–carbon–iron systems (cont'd)
equilibrium constant as a function of C content for, 9: 6279
Nickel–carbon–titanium systems
microstructure and phase studies, 9: 3457
Nickel carbonyls
formation of, from Ni and Co, thermodynamics, 9: 3393(J)
gas plating of Cu from, 9: 6281(R)
heat capacity, heat of fusion, and melting point, 9: 3393(J)
Nickel–cerium alloys
crystal structure, 9: 683(J)
Nickel chelates
with 2,4-pentanedione, formation constants, enthalpy, and entropy, 9: 3390(J)
spectra, 9: 7675
Nickel–chromium alloys
constitution diagrams, Cr rich portion of, 9: 1876(J)
creep, intercrystalline fracture, and grain structure, 9: 4456
magnetization, theory and measurement, 9: 4209
oxidation at high temperatures, mechanism of, 9: 2325(J)
resistance sintering under pressure, 9: 1878(J)
specific heat and enthalpy, 9: 2308(J)
surface tension and wettability, 9: 7752(R)
surface tension and wettability, determination, 9: 4777(R)
Nickel–chromium coatings
deposition on Cu, 9: 6281(R)
gas plating method for, on Cu, 9: 5955(R), 6280(R)
Nickel–chromium–cobalt alloys
static, fatigue, and mechanical properties of wrought N-155 alloy at elevated temperatures, 9: 4170
Nickel–chromium–cobalt–iron alloys
analysis of, using anion-exchange separations, 9: 1544(J)
weldability of wrought, 9: 3530(J)
Nickel–chromium–cobalt–tungsten alloys
mechanical properties, effects of rare earth additions on, 9: 4457
preparation, fabrication, density, tensile properties, microstructure, hardness, and temperature effects of aged and sintered X-40 compacts, 9: 3173
weldability of wrought, 9: 3530(J)
Nickel–chromium–iron alloys
vacuum melting and casting, 9: 2727(R)
Nickel–chromium–iron–molybdenum alloys
tensile properties, creep-rupture at 1350 and 1500°F, and microstructure, 9: 3859
Nickel–chromium–molybdenum alloys
oxidation at 950°C, 9: 3146
weldability of wrought, 9: 3530(J)
Nickel–chromium steel
characteristics of the bainite transformation in, and X-ray-diffraction analysis, 9: 5963
corrosion resistance, effect of Mo addition, 9: 6332(J)
isothermal embrittlement in, during tempering from 800°F to lower critical temperature, 9: 4188
oxidation, 9: 949
Nickel–cobalt–molybdenum–tungsten alloys
compression-creep properties, 9: 3504(R)
compressive-stress-rupture properties of high temperature, 9: 3503(R)
Nickel coatings
porosity, determined by radioautographic inspection, 9: 147
on steel, corrosion and weldability of, 9: 171
Nickel–cobalt alloys
oxidation, 9: 5364(J)
Nickel–cobalt–uranium alloys
pseudo-binary phase sections between Laves phases in, 9: 3353(J)
Nickel complexes
with 2-nitroso-1-naphthol-4-sulfonic acid, chemical properties, 9: 513
with o-phenanthroline, sulfonated oxine, and naphthalenediamines, electrodeposition from aqueous solutions of, electronic configuration in, 9: 2625(J)
Nickel(II) complexes
with vic-dioximes, magnetic studies of, 9: 2155(J)
Nickel compounds
polarographic behavior of, in molten ammonium formate, 9: 7292
Nickel–copper alloys
corrosion by chlorinated and alkalized boiler water and pure deionized water, 9: 3168
corrosion in high-temperature waters, 9: 3459
magnetic and thermal properties, theory and measurement, 9: 4209
tensile properties of commercial and high-purity effect of temperature on, 9: 2309(J)
welded joints of, with stainless steel, thermal rupture, 9: 1264
Nickel–copper couples
diffusion in, effects on cross section area, 9: 3526(J)
diffusion processes in, 9: 4191(J)
Nickel crystals
creep and hardness of, effects of impurities and imperfections on, 9: 970
Nickel films
thin, preparation and hexagonal structure, 9: 4088
Nickel fluorides
adsorption of ClF_3 on porous, 9: 6919(J)
formation from fluorination of NiO, kinetics, 9: 6608(J)
Nickel(II) fluorides
crystal structure, 9: 92(J)
heat capacity of, from 12° to 300°K, 9: 5901(J)
Nickel–germanium alloys
phase studies, 9: 3184(J)
Nickel–gold alloys
calorimetric measurements during precipitation in, 9: 4818(J)
enthalpy change and strain energy in formation of solid solutions of, 9: 187
entropy, 9: 188(R)
entropy of solution for, measurements, 9: 1864(R)
Nickel hydrides
preparation of, by reaction with atomic H, 9: 635(R)
Nickel hydroxide–nickel couples
value of standard potential of $Ni–Ni(OH)_4$, 9: 2616(J)
Nickel hydroxides
oxidizing properties and decomposition of $Ni(OH)_4$, 9: 2616(J)
Nickel–indium alloys
surface tension and wettability, 9: 7752(R)
Nickel(II) ions
thermodynamic formation constants in aqueous solution for reaction of, with acetylacetonate at 30°C, 9: 1191(J)
Nickel–iron alloys
diffusion of Fe in, effect of alloy compositions on, 9: 7793
diffusionless phase transformation and crystal structure, 9: 1861(R)
heat treatment, controlled atmospheres for, 9: 6279
magnetic properties, 9: 1067(R)
magnetic structure, neutron diffraction studies of, 9: 2312(J)
oxidation at high temperatures, 9: 6307(J)
superlattice formation of, in steady temperature annealing, 9: 2773(J)

Nickel–iron–carbon systems
phase studies, 9: 2317(J)

Nickel–iron–molybdenum alloys
oxidation at 920 and 1110°C, 9: 3146

Nickel–iron–uranium alloys
pseudo-binary phase sections between Laves phases in, 9: 3353(J)

Nickel isotopes
atomic masses, mass spectroscopic values, reliability, 9: 6910(J)

Nickel isotopes Ni^{56}
alpha reactions (α,γ), 9: 7893(R)
reaction energy of $Ni^{58}(d,n)Cu^{59}$, 9: 7918(J)

Nickel isotopes Ni^{60}
angular distribution of γ rays in, 9: 6471(J)
gamma emission, angular correlation of, 9: 1406(J)
gamma-gamma directional correlation function, 9: 3632(J)
lifetime for first excited state, upper limit of, 9: 1072(J)
lifetimes of two excited states of, upper limit to, 9: 2509(J)
nuclear spin, 9: 4204(R)

Nickel isotopes Ni^{63}
electrolytic separation of, 9: 289
radiometric determination of trace amounts of, in animal tissues, 9: 1156(R)
toxicology of, for rats, 9: 1156(R)

Nickel–lanthanum alloys
crystal structure, 9: 683(J)

Nickel–manganese alloys
brittle failure of brazing wire containing 60% Mn, causes and prevention, 9: 4169
heat capacities, 9: 5077
high-temperature scaling, 9: 6261(R)
neutron diffraction studies of magnetic structure of, 9: 2312(J)
x-ray-diffraction analysis using high-temperature furnace, 9: 4822

Nickel–manganese–molybdenum alloys
oxidation at 940°C, 9: 3146

Nickel–manganese–oxygen systems
phase diagrams, 9: 6261(R)

Nickel–manganese–uranium alloys
pseudo-binary phase sections between Laves phases in, 9: 3353(J)

Nickel molybdates
crystal structure and x-ray-diffraction patterns, 9: 3146
phase transformation and spalling in, effect of oxide addition on, 9: 3146

Nickel–molybdenum alloys
oxidation kinetics, 9: 1274(J)
oxidation testing at 930, 940, and 945°C, 9: 3146
weldability of wrought, 9: 3530(J)

Nickel–nickel hydroxide couples
value of standard potential of $Ni–Ni(OH)_4$, 9: 2616(J)

Nickel oxides
ceramics, resistivity of, 9: 5946(J)
fluorination by ClF_3, kinetics, 9: 6608(J)
heat and free energy of formation, 9: 529(J)
pyrolytic, activated adsorption of gases by, effect of free energy of the process of preparation on, 9: 65
reduction with hydrogen, kinetics of, 9: 2617(J)
single crystal neutron-diffraction study, 9: 2099(R)
slow neutron cross sections, 9: 1391(J)

Nickel–oxygen–titanium systems
phase studies, 9: 1874(J)

Nickel–platinum alloys
relaxation effects in solid solutions of, arising from changes in local order, 9: 204(J)

Nickel powders
heats of adsorption of N on, 9: 1789(R)

Nickel–silicon oxide systems
heats of adsorption of N on, 9: 1789(R)

Nickel–silicon systems
phase studies, 9: 3184(J)

Nickel steel
heat treatment, effect of $CO–CO_2$ atmospheres on, 9: 7784
isothermal embrittlement in, during tempering from 800°F to lower critical temperature, 9: 4188

Nickel systems
as brazing alloys, chemical and physical properties, 9: 5066

Nickel–tin alloys
surface tension, 9: 2702(R)
surface tension and wettability, 9: 7752(R)

Nickel–titanium alloys
constitution diagrams and chemical analysis, 9: 6296(J)
grain-boundary diffusion in, as bonding agent between Ti and steel, 9: 4182
powder preparation, microstructure, and x-ray-diffraction patterns, 9: 3841(R)
surface tension and wettability, 9: 4477(R), 7752(R)
thermal decomposition of transformed β-phase in, phase studies and microstructure, 9: 7813(J)

Nickel–titanium carbide compacts
mechanical properties of, 9: 1820(R)
microstructure, effect of ball-milling, pressing, and sintering on, 2756(J)
properties, effects of impurities on, 9: 5643
vibratory compacting, 9: 4173(R)

Nickel–titanium carbide systems
impact and stress-rupture testing, 9: 4991(R)
properties, effects of additions of O and Mo_2C on, 9: 4992(R)

Nickel–uranium alloys
preparation and properties, 9: 1431(P)

Nickel–zirconium alloys
corrosion resistance in 680°F water, effect of heat treatment on, 9: 7331

Nicotinamides
biosynthesis of, from 3-hydroxyanthranilic acid in rats, tracer study, 9: 124(J)

Nicotine
effects of, on CO_2 metabolism in rats, tracer study, 9: 2136(R)
relationship between cigarette smoking, serum lipoproteins, and coronary heart disease, 9: 4912

Niobium
anhydrous separation of, by selective chlorination of partially hydrolyzed chlorides, 9: 908(J)
chromatographic determination of, in soil samples, 9: 3404(J)
colorimetric determination in presence of Ta, 9: 2176(J)
colorimetric determination in presence of Ti, 9: 6907(J)
determination of microgram amounts of, in iron by x-ray fluorescence analysis, 9: 4382
deuteron reactions (d,p) at 15 Mev, proton energy spectra from, 9: 4574(J)
electrochemical reduction, number of electrons in, 9: 6603(J)
electroplating of, with Fe, pretreatment, 9: 5351
fabrication and high-temperature strength, 9: 5350
gravimetric determination of, in U- or Zr-base alloys, 9: 5274(J)

Niobium (cont'd)
intermetallic compounds with Ir, Os, Pt, and Sn, preparation and structure, 9: 3878(J)
liquid-liquid extraction of, with hydrochloric acid from aliphatic ketone solutions, 9: 907(J)
neutron-diffraction studies of superconducting state, 9: 3218(J)
oxidation of, under conditions of linear temperature increase, 9: 182
polarographic behavior and determination of, in H_2SO_4, 9: 538(J)
preparation, properties, and industrial uses, review, 9: 7371(J)
production of, by chlorination of Nb ores, 9: 1745
proton reactions (p,γ), 9: 1066(R)
quantitative separation and determination in mixtures of Ta and, 9: 7703(J)
radiochemical determination, 9: 876
separation from Ta, 9: 2666
separation of, by anion exchange, 9: 912(J)
spectrographic determination of, in ores and rocks, 9: 162
spectrophotometric determination of, in ores, 9: 3405(J)
spectrophotometric determination of, in steel, 9: 4080(J)
spectrophotometric determination of, in U ternary alloys, 9: 4074
volumetric determination of Zr in the presence of, 9: 7702(J)

Niobium alloys
fabrication and high-temperature strength, 9: 5350

Niobium–aluminum–titanium alloys
oxidation, 9: 3849(R)

Niobium boride–titanium boride systems
preparation and properties, 9: 6957(J)

Niobium borides
diffusion into TiB_2, reciprocal, 9: 5320(J)
preparation by vacuum technique, 9: 1821(J)
reactions with C and N_2, equilibria studies, 9: 5677(J)

Niobium carbides
preparation and phase studies, 9: 2148(J)
properties of, effect of molten Ti on, 9: 2247

Niobium–carbon–silicon systems
phase diagrams, 9: 4704

Niobium–iron alloys
potassium carbonate fusion of, for production of Nb_2O_5, 9: 2666

Niobium isotopes Nb^{89}
decay scheme of Nb^{89m} and, 9: 2060(J)
nuclear properties, 9: 735

Niobium isotopes Nb^{90}
decay scheme, 9: 3341(J)
isomeric states from Mo^{90} decay, 9: 4328(J)
nuclear properties, 9: 735

Niobium isotopes Nb^{93}
nuclear quadrupole moment, 9: 5480(J)
nuclear resonance in $KNbO_3$, 9: 1351(J)

Niobium isotopes Nb^{94}
half life and β and γ emission, 9: 4016(J)

Niobium isotopes Nb^{95}
decay scheme, literature survey, 9: 2068(J)
K-shell internal conversion coefficients and multipolarity assignments, 9: 5535(J)

Niobium–molybdenum alloys
creep-rupture strength of, 9: 633

Niobium ores
chlorination of, for production of Nb, 9: 1745
production of Nb_2O_5 from, by K_2CO_3 fusion, 9: 2666

Niobium oxides
band spectra of NbO, 9: 3798(J)
chlorination of, between 320 and 1000°C, 9: 1745
heat and free energy of formation, 9: 529(J)
hydrochloric acid solutions, composition and properties, 9: 4938(J)
powder diffraction analysis of Nb_2O_5, 9: 5912(J)
production of Nb_2O_5 by K_2CO_3 fusion of Nb ores, 9: 2666
spectral analysis of the blue band system of, 9: 1227(J)

Niobium–oxygen–tantalum systems
phase studies, 9: 6260

Niobium silicides
reactions with C and N_2 at 2000°K, 9: 4704

Niobium steel
welding cracks, 9: 4465(J)

Niobium sulfides
x-ray studies of, 9: 887(J)

Niobium–titanium alloys
resistivity-temperature-concentration relationships of, 9: 1538(J)

Niobium–uranium alloys
determination of Sn and Zr in ternary, 9: 4074

Niobium–zirconium alloys
fabrication and phase studies, 9: 1530(R)
preferred orientation of β-annealed, 9: 189
tensile properties, 9: 5058(R)

Nitrate ions
effect of radiation on, in aqueous solutions, 9: 6928(J)

Nitrates
(See also nitrates of specific elements; see also Ammonium nitrates; Rare earth nitrates; Uranyl nitrates.)
fused, electric conductivity, 9: 2139(J)
modification of DuPont nitrometer for determining, 9: 2640(J)

Nitric acid
analysis of fuming, for HF, 9: 6196
concentration, pilot plant design, 9: 4058
corrosive effects on Ti, electron diffraction analysis of, 9: 5970(J)
determination in solutions containing HNO_3, U, and Fe, 9: 6606
digestion of Florida leached zone material with, 9: 6183
fuming, thermal decomposition of, kinetics, 9: 6800(J)
kinetics of reactions with CO, NO, and H_2 and thermal decomposition, 9: 3051
normal and D-labeled, thermodynamic functions and structure parameters of gaseous, 9: 6895(J)
partition between water and diethylether, methylisobutyl ketone, and dibutyl carbitol, 9: 3110(J)
polarization, corrosion, and erosion-corrosion of Al, Al–stainless couples, Al alloys, and stainless steels in fuming, design and performance of equipment for testing, 9: 2255(J)
production from Florida leached zone material, cost factors, 9: 7270
reaction of, with Ti, accident report, 9: 3456(J)
recovery from a raffinate solution, 9: 5623

Nitric acid–hydrochloric acid systems
vapor-liquid equilibria, 9: 5623

Nitric acid–hydrofluoric acid systems
analysis for HF, 9: 6196
specific gravity and volumetric determination of hydrofluoric acid in, 9: 1202(J)
vapor tension and calorimetry of 100% and aqueous, effect of $NaNO_3$, KNO_3, and water additives on, 9: 2140(J)

Nitric acid–butyl phosphate systems

solvent properties of, for rare-earth nitrates, 9: 901

Nitric acid–butyl phosphate–uranyl nitrate systems

uranium solvent extraction from, performance of a louvre-plate redistributor for large-diameter pulse columns in, 9: 588(J)

Nitric acid–nitrogen oxide systems

conductometric analysis, 9: 75

Nitric acid systems

corrosion of stainless steel in HNO_3–$K_2Cr_2O_7$ solutions, 9: 1885(J)

Nitrides

(See also nitrides of specific elements.)

preparation and x-ray-diffraction analysis of metallic, 9: 3380

Nitrites

fused, electric conductivity, 9: 2139(J)

modification of DuPont nitrometer for determining, 9: 2640(J)

Nitro compounds

effects on rate of catalytic exchange between D and acetic acid, 9: 2182(J)

Nitrogen

absorption coefficient for photoionizing radiation, 9: 5810(J)

adsorption of, by fine particles, use as surface area determination, 9: 56(R)

adsorption of, by graphite at low temperatures, 9: 4399(J)

atmosphere, effects on radiosensitivity of S. cerevisiae, 9: 5216(J)

chemisorption of, on Ti, 9: 7788

collision processes of 14- to 41-kev O ions in, 9: 7566(J)

continuous detection and measurement of low concentrations of O_2 by dew-point method, 9: 2636(J)

determination by N^{14} (d,n)O^{15} reaction, 9: 2179(J)

determination in U, 9: 7288

diffusion in Ti, 9: 978(R), 2339(J)

dissociation of, under electron impact, 9: 5978(J)

effect on tensile properties of arc-deposited C steel weld metal, 9: 223(J)

effects on radioinduced chromosome aberrations in Tradescantia, 9: 3020(J)

effects on properties of Ti alloy welds, 9: 226(J)

electric breakdown processes in, 9: 2377(J)

energies of K transitions of π-mesonic x rays from, 9: 1909(J)

energy loss of positive ions single scattered in, 9: 1377(J)

energy required to produce one ion pair, 9: 5702(J)

excretion of, effects of total-body x irradiation on in rats, 9: 2568(J)

gas chromatographic elution of gases and volatile liquids from alumina, silica gel, or charcoal by, 9: 2672(J)

heat of adsorption on finely divided solids, experimental determination, 9: 1789(R)

heat of vaporization, calculated values of, 9: 1789(R)

interaction with cosmic radiation, production of Be^7, 9: 3655(J)

ion pair formation, 9: 4039(R)

ionic species formed by collision of gaseous ions in, 9: 1378(J)

ionization by α particles and fission fragments, 9: 2821

ionization yields, 9: 999(J)

isotopic content of atmospheric, in air and ocean water, 9: 662(J)

Kjeldahl method for analysis of, effect on NH_3 decomposition in, 9: 7296

melting curves for, 9: 6746(J)

π-mesonic atoms of, x radiation from, 9: 7082(J)

determination, calibration of meter for, using gas mixtures of N_2, O_2, Co_2, and H_2O, 9: 877

neutron differential elastic scattering cross sections from 0.8 to 2.36 Mev, 9: 4601(J)

neutron elastic scattering cross sections, 9: 1067(R)

Nitrogen (cont'd)

nutrition and metabolism in plants studied by N^{15}, 9: 7660(J)

oxidation, effects of γ radiation on, 9: 7720(J)

photoionization efficiencies and cross sections in, 9: 6747(J)

proton reactions at 140 Mev, 9: 5800(J)

proton total cross sections at 208 and 315 Mev, 9: 358(J)

protons inelastically scattered by, resonances for and mean life of excited state from, 9: 6453(J)

purification and separation from A by hot metals, 9: 2382

reaction of, with U in temperature range 550 to 900°C, 9: 5309(J)

reaction with Zr and diffusion in Zr at high temperatures, 9: 2145(J)

reactions with metal borides, equilibria, 9: 5677(J)

scattering of electrons and positrons, 9: 5798(J)

scattering of molecules from surfaces, 9: 650

semimicro determination in organic compounds, 9: 2166(J)

solidified, compressibilities at low temperature, 9: 2824(J)

specific ionization of, by high-energy electrons, 9: 3315(J)

thermal conductivity and viscosity of, from 0 to 600°C, 9: 2822

thermodynamic functions of, to 12,000°K, 9: 1896

thermodynamic properties, effect of dissociation on, 9: 7840

tritium and neutron production from, by 2.2-bev protons, 9: 2922(J)

ultraviolet emission by α bombardment, 9: 3241(J), 5405(J)

virial coefficients, 9: 3081

volumetric determination of, in Ti and Ti alloys, 9: 4944

Nitrogen (liquid)

solubility of H in, at 79 to 109°K and pressure to 190 atm., 9: 239(J)

solubility of He in, between 78 and 109°K and up to 295 atm., 9: 240(J)

solubility of H_2 and D_2 in, estimation, 9: 5896(J)

thermal shielding properties, 9: 654

Nitrogen–aluminum–titanium systems

mechanical properties, 9: 3854(R), 4789(R)

Nitrogen–argon systems

filling of ion chambers with, advantages, 9: 3949(J)

Nitrogen–chromium–titanium systems

electrical resistance of films of, 9: 2345(J)

Nitrogen fixation

in nuclear reactors, 9: 3094(J)

power factor pressure dependence in high-frequency discharge, 9: 5987(R)

Nitrogen fluorides

thermodynamic properties from 12° to 144°K, 9: 3413(J)

Nitrogen–hydrogen systems

phase studies, 9: 239(J)

Nitrogen–hydrogen–titanium systems

preparation and constitution diagrams, 9: 4187

Nitrogen ion beams (N^{14})

electron loss by 485- to 1180-kev, cross sections, 9: 7563(J)

nuclear reactions in C^{13}, compared to proton reactions in Mg^{25}, 9: 1849(J)

Nitrogen ion sources

design of cyclotron, 9: 7948(J)

Nitrogen ions

bombardment of chlorine by, activities produced from, 9: 5801(J)

distribution of charge after passage through matter, 9: 5175(J)

electron capture and loss by 26-Mev, cross sections for, 9: 5809(J)

energy loss in gases of positive single scattered, 9: 1377(J)

equilibrium charge distribution of energetic, in Formvar, 9: 4498(J)

ionic species formed in gases by collision with, 9: 1378(J)

range in Ilford C-2 emulsions, 9: 421(J)

Nitrogen–iron systems
size of interstitial solute atoms, lattice expansion, and electronic properties of close-packed, 9: 1780
surface tension, 9: 2702(R)
surface tension and wettability, measurements of, 9: 653(R)

Nitrogen isotopes
height and geographical distribution, 9: 2130
separation of, by ion exchange, 9: 3246(J)

Nitrogen isotopes N^{13}
beta decay and intermediate coupling, 9: 3625(J)
production of, by 0.4- to 3.0-Bev proton bombardment of Al, cross sections for, 9: 6074(J)

Nitrogen isotopes N^{14}
angular correlation between γ rays in $N^{14}(d,\alpha\gamma\gamma)C^{12}$ reaction, 9: 3659(J)
angular distribution of neutrons from $C^{14}(p,n)N^{14}$ reaction, 9: 6763(J)
bombardment of aluminum with, Cl^{35}/Cl^{34} ratio from, 9: 6081(J)
deuteron reactions (d,α), search for 15-mev γ rays from, 9: 769(J)
deuteron reactions (d,γ), energy and intensity of γ rays from, 9: 379(J)
deuteron reactions (d,γ), spectra, 9: 7121(J)
deuteron reactions (d,p), 9: 1393(J), 1397(J)
deuteron reactions (d,p), angular distribution measurements, 9: 4205(R)
elastic scattering of 9.5-Mev protons, 9: 1389(J)
excitation energies of excited states of, 9: 4875(J)
gamma reactions (γ,α) and excited states, 9: 1116(J)
gamma reaction (γ,α) cross sections, 9: 6484
intermediate coupling model applied to structure of, 9: 7119(J)
isotopic effects on N metabolism in buckwheat, 9: 3(R)
neutron scattering, 9: 1384(J)
nuclear magnetic moment of, calculated by proton-neutron coupling, 9: 742(J)
nuclear quadrupole moment, 9: 2896(J)
from nuclear reactions C^{13} (d,n), neutron spectra and angular distributions of, 9: 7114(J)
proton capture cross sections, and production of O^{15}, 9: 6071(J)
radiative capture of α particles in, from 1.2 to 2.2 Mev, 9: 6490(J)
separation from N^{15} by ion exchange, 9: 5621

Nitrogen isotopes N^{15}
angular distribution of γ rays from $C^{14}(p,\gamma)N^{15}$ reaction, 9: 6763(J)
bibliography, 9: 5711
energy levels, 9: 1393(J)
enrichment of, by chemical exchange in thermal diffusion columns, 9: 5922(J)
isotopic effects on N metabolism in buckwheat, 9: 3(R)
mass spectrometric determination, sample preparation, 9: 2180(J)
neutron scattering and nuclear properties, 9: 1067(R)
nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)
parity assignments from neutron elastic scattering in N, 9: 4601(J)
proton reactions (p,n), 9: 1067(R)
proton reaction (p,n), threshold value in, 9: 7551(J)
separation from N^{14} by ion exchange, 9: 5621
shift of the perpendicular bending frequency in KNO_3 and $NaNO_3$ due to, 9: 191(J)

Nitrogen isotopes N^{17}
neutron emission, 9: 7957
photonuclear yields of, from O^{18}, F^{19}, Na^{23}, Al^{27}, Ne, and Mg, 9: 3644
yields from deuteron bombardment of light elements, 9: 4872

Nitrogen–manganese–titanium systems
fabrication, heat treatment, phase studies, mechanical properties, microstructure, and aging characteristics, 9: 1856

Nitrogen–manganese–titanium systems (cont'd)
phase studies and microstructure, 9: 1873(J)

Nitrogen mustards
effects of, on viscosity of alginates, 9: 3658(J)
effects of exposure to, on aqueous protein solutions, 9: 6612(J)
effects of exposure to, on development of eggs of Habrobracon, 9: 3024(J)
protective action of cysteine and 2-aminoethanethiol against, 9: 4358

Nitrogen oxide–nitric acid systems
conductometric analysis, 9: 75

Nitrogen oxides
atomic polarizations and dipole moments of, theory, 9: 2868(J)
corrosive effects on Fe, Ta, W, Mo, Ni, Cu, Ag, Ni alloys, and stainless steel, 9: 6308(J)
decomposition of N_2O, effect of x- and α radiation on, 9: 7715(R)
enrichment of N^{15} in, by chemical exchange in thermal diffusion columns, 9: 5922(J)
formation of, during heliarc welding in atmosphere on N, 9: 629
heat and free energy of formation, 9: 529(J)
kinetics of reaction of nitric acid with NO, 9: 3051
microwave spectra, Zeeman shift in, 9: 1134(R)
microwave spectra and dielectric constants, 9: 342
reaction with thorium nitrate tetrahydrate, 9: 2224(J)
thermodynamic functions of, to 12,000°K, 9: 1896
toxicology, 9: 502(J), 503(J), 504(J)
toxicology of, formed during heliarc welding in N atmosphere, 9: 629

Nitrogen–oxygen systems
electric breakdown processes in, 9: 2377(J)

Nitrogen–titanium systems
constitution diagrams, 9: 2339(J)
fabrication, heat treatment, and effect of microstructure on mechanical properties of, 9: 178
mechanical properties of, effects of structure and composition on, 9: 201(J)
microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296
preparation, double inert-gas arc melting, forging, and welding, 9: 3489(R)
size of interstitial solute atoms, lattice expansion, and electronic properties of close-packed, 9: 1780(J)
tensile properties in the temperature range -196 to 515°C, 9: 5667

Nitrogen–zirconium systems
size of interstitial solute atoms, lattice expansion, and electronic properties of close-packed, 9: 1780

Nitrometers
modification of DuPont, 9: 2640(J)

Nixon Fork Area (Alaska)
uranium distribution in, 9: 1523(J)

Noise
cable, due to shock, vibration, or transient pressures, measurement, 9: 5679
spectrum analyzer for scintillation detectors, 9: 1310(J)

Nomographs
for angular distributions in stripping reactions, 9: 4579(J)
for converting corrosion rates, 9: 2254(J)
for estimating energies of nuclear reactions, 9: 2916(J)
for obtaining rank correlation coefficient, 9: 2846(J)
for radioisotope buildup and decay, 9: 4021(J)
slide rule, for Co^{60} radiotherapy, 9: 3042(J)

Non-destructive testing
(See Materials testing.)

North American Aviation, Inc., Downey, Calif.
progress reports on solid state physics, 9: 7389(R)
progress reports on weldable Ti alloy program, 9: 5656(R)

North American Aviation Reactors
(See Sodium graphite reactors; Uranium Production Reactor; Water boiler neutron sources.)

North Carolina
geology and prospecting for radioactive minerals, 9: 5323

North Carolina Research Reactor
control rod and temperature experiments and neutron flux measurements, 9: 5149
meteorological dispersal of stack gases from, 9: 3978
reactivity loss in, prevention, 9: 7533(J)

North Carolina State Coll., Raleigh
progress reports on performance of contactors for liquid-liquid extraction, 9: 4747(R), 4748(R)
progress reports on vibratory compacting of metal and ceramic powders, 9: 4173(R)

North Dakota
coal deposits, map of, 9: 5332(J)

North Fork–Shoup District (Idaho)
exploration for U and Th deposits in, 9: 1520(J)

North Point No. 6 Area (Utah)
geophysical exploration, geology, mineralogy, and stratigraphy, 9: 1512

Northern Black Hills (S. Dak.)
exploration and U distribution, 9: 165(J)

Northern Black Hills (Wyo.)
exploration, 9: 1514(R)

Northwest Willys Group (Nev.)
exploration, geology, mineralogy, and U distribution, 9: 1516(J)

Notom Quadrangle (Utah)
photogeologic map of, 9: 5016(J)

NRX Reactor
experimental facilities available, 9: 7923
xenon poisoning, 9: 6705

Nuclear aircraft
(See also Aircraft reactors; Aviation personnel.)
structural alloys, thermal neutron gamma activation tables for, 9: 6508

Nuclear batteries
(See also Photoelectric cells.)
design, performance, and theory, 9: 268(R), 4226
developmental studies, 9: 3548(R), 3549(R), 3550(R)
design and development, 9: 348
design and performance, 9: 266, 3208(R)
design and performance of, using PbO_2 on stainless steel, 9: 267(R)
design of p–n junction, 9: 251(J)
performance of, as charger for ionization chambers, 9: 2825(R)
utilizing fission products, design, 9: 7028

Nuclear chemistry
(See also Radiation chemistry; Radiochemistry; Tracer techniques.)
bibliographies, 9: 6185, 6186
concepts and practical applications, 9: 5882
review, 9: 5305(J)

Nuclear electric moments
(See also Nuclear Magnetic moments.)
calculation from electron scattering, 9: 6761(J)

Nuclear electric moments (cont'd)
dipole transitions in nuclear photoeffect, calculation with independent-particle model, 9: 1995(J)
effect on angular correlations, 9: 3622
measurement from γ-γ angular correlations, 9: 1348(J)
quadrupole, interaction with electron shell, effect on angular correlation of successive nuclear radiation, 9: 6468(J)
quadrupole, of the deuteron, calculation with pseudoscalar meson theory, 9: 367(J)
quadrupole, spin-lattice relaxation in crystals due to, theory of, 9: 1012(J)
quadrupole moments of odd nuclei, 9: 7208(J)
of sodium (Na^{23}) by atomic beam resonance, 9: 4555(J)
tables, 9: 5145(J)

Nuclear emulsions
(See also Photographic emulsions; Photographic film; Photographic film detectors.)
alignment of stacks by punched holes, 9: 4517
alpha tracks in, 9: 3674(J)
apparatus for gap length measurement, 9: 1019
calculation of actual thickness, 9: 7466(J)
calculation of nuclear events by track analysis, 9: 1056(J)
charged particles in, characteristics of tracks of, 9: 5436(J)
coating device to obtain very thin films, 9: 5411(J)
correction of track length for grain density and background, 9: 1982(J)
cosmic radiation observed in, underground, 9: 7832(J)
cosmic star distribution in, exposed at mountain altitudes, 9: 5691(J)
counting of granular groups in, 9: 6409(J)
detectors with stacked, construction of, 9: 1049(J)
developing techniques for α-p and α-t tracks in C-2 emulsions, 9: 2852
development of thick, with amidol in acid medium, 9: 720(J)
diffusion in the sensitive layers, 9: 2859(J)
diffusion of Rn in, variances in, 9: 4521(J)
distortion, 9: 2851
distortion in thick, prevention of, 9: 7459(J)
electron background variations, 9: 7069
electron emission and absorption measurements by, 9: 6367(J)
embedded wires in, to study specific nuclear interactions, 9: 1052(J)
fixing, 9: 319(J)
heavy mesons produced in, by 2.2- and 3.0- Bev protons, 9: 6016(J)
heavy-particle properties determined in, as functions of velocity, 9: 304
increased sensitivity of α-particle photographic detection, 9: 7458(J)
interaction of 350-Mev α particles in, 9: 5780(J)
interaction of 17-Mev mesons, 9: 3616(J)
ionization in, measurement of, 9: 5797(J)
isothermal processing, 9: 3592(J)
K particle mass measurements, 9: 6026(J)
liquid, use in autoradiography, 9: 7252(J)
loaded with glass tubes filled with solutions of the target element, preparation, 9: 5119(J)
mass determination by method using, 9: 6408(J)
mass determination of minimum ionization particles in, 9: 5733(J)
mass measurements of particles in, and existence of 1450 m_e mesons, 9: 7478(J)
masses of cosmic mesons measured by tracks in, 9: 7490(J)
mean free path of α particles, 9: 3966(R)
mean lifetime of K^+ mesons from measurements with, 9: 7479(J)
measurement of α particle tracks in, 9: 713(J)
measurement of cosmic neutrons below H_2O by, 9: 3946(J)
measurement of diffusivity of an α tracer into a solid with, 9: 6257(J)

Nuclear emulsions (cont'd)
measurement of particle tracks by mean gap lengths, 9: 699
measurement of particle tracks in, by kinetic nucleography, 9: 712(J), 714(J)
meson and proton energy relations in, tables of, 9: 1557(J)
meson interactions in, 9: 777
methodological study, 9: 4532(J)
microinterferometric examination of particle tracks in, 9: 2430(J)
microscopes for scanning, 9: 2853
multiple scattering measurements in, 9: 3325(J)
multiple scattering of protons in, 9: 2483(J)
neutron energies from tracks in, slide rule technique for calculating, 9: 6749(J)
nuclear disintegrations in, produced by 950-Mev protons, 9: 7542(J)
nucleon-nucleon collisions studied by, 9: 7417(J)
observation of slow particles and stars in, at 17 m.w.e. underground, 9: 7042(J)
particle track thickness of heavy nuclei, 9: 3598(J)
phase transformation in gelatin after drying, 9: 4521(J)
photodisintegration experiments with, 9: 7103(J)
photoelectric counting apparatus, 9: 322(J)
photomeasurement of particle tracks in, 9: 709(J)
photometric analysis of particle tracks, 9: 3271
Polaroid Radiographic Packet No. 1001, evaluation of, for industrial radiography, 9: 143
porous structure of, and effect of hydrophilic liquids, 9: 3599(J)
"print-out" effects with dilute developer, 9: 2858(J)
proton-proton scattering in, at 432-Mev, 9: 7175(J)
range-energy relations for ions of charge greater than 2, 9: 408(J)
range-energy relations of protons and π mesons in, 9: 3939(J)
range-energy relations of tritons in, up to 10 Mev, 9: 4250(J)
range of nitrogen ions in Ilford C-2, 9: 421(J)
range of 208-Mev protons in G5, 9: 3669(J)
range straggling and H blackening in, 9: 2890(R)
range straggling in, theory, 9: 4594(J)
recoil tracks produced by 50- to 450-Mev protons, 9: 1569(J)
response to β radiation, quantitative relationship, 9: 7074(J)
scattering angle of electrons from Bi^{210} in, 9: 715(J)
scattering constant for charged particles in, 9: 4303(J)
scattering measurements in, and their application to measuring charge of primary cosmic ray nuclei, 9: 5732(J)
scattering of 160-Mev pions by protons in, 9: 1108
scattering of π mesons in, theory of, 9: 1142(J)
shrinkage factor in, method of measurement, 9: 7405(J)
silver chloride, study of $Cl^{35}(n,p)S^{35}$ reaction with, 9: 6489(J)
stars in, of protons and photons, 9: 7884(J)
stars produced in, analysis of, 9: 6098(J)
stopping of heavy negative mesons in, 9: 328(J)
stripping and remounting, 9: 5735(J)
tables for particle track measurements, 9: 4245
theory of tracks in, 9: 7076(J)
thick, bilateral development of, 9: 7459(J)
thick, procedures for preparing, for quick tracing of tracks, 9: 310(J)
thickness corrections, calculation, 9: 6731(J)
track counting in solid angles, corrections for, 9: 1967(J)
wetting effect in, probability of nuclear events during, 9: 1294(J)

Nuclear engineering
principles of, book on, 9: 7535(J)
text on introductory, 9: 373(J), 374(J)

Nuclear explosions
biological effects of radiation from, 9: 4921(J)

Nuclear forces
(See Nuclear theory.)

Nuclear induction
in inhomogeneous magnetic fields, 9: 5759(J)
matrix treatment of, 9: 5758(J)

Nuclear isomers
bromine Br^{80}, retention difference in liquids, 9: 7109(J)
general discussion of, 9: 6446(J)
lifetimes of, 9: 5142(J)
properties and transformation diagrams, 9: 7896(J)

Nuclear magnetic moments
(See also Nuclear electric moments.)
calculation of from j-j coupling, 9: 355(J)
of conjugate nuclei, 9: 3639(J)
correction terms in calculation, 9: 746(J)
determination of, justification of modified independent particle model in, 9: 6049(J)
of deuteron, calculation with pseudoscalar meson theory, 9: 367(J)
dipole, interaction with electron shell, effect on angular correlation of successive nuclear radiations, 9: 6468(J)
exchange contributions to, 9: 7211(J)
of fluorine(F^{19}) 107-kev excited state, 9: 7910(J)
measurement from γ-γ angular correlations, 9: 1348(J)
measurement of, magnetic shielding effect in, 9: 3629(J)
octupole, of Ga^{69} and Ga^{71}, measurement, 9: 359(J)
tables, 9: 5145(J)

Nuclear magnetic resonance
absorption theory, 9: 1628(J)
absorption theory, stochastic, 9: 1629(J)
of alkali metals, 9: 5771(J)
apparatus for production of frequencies by, 9: 353
in aqueous-electrolyte solutions, 9: 5084(J)
design and performance of spectrometer for quantitative analysis by, 9: 2678(J)
explanation of, in terms of nuclear spin exchange, 9: 3972(J)
gaussmeter for measuring, 9: 1618(J)
in hydrogen, B^{11}, and F^{19}, 9: 7025(R)
line shape of, effect of chemical shift and J coupling on, 9: 1636(J)
in liquids, 9: 5769(J)
in liquids, analysis of spin-spin multiplets, 9: 5471(J)
in liquids under high pressure, 9: 2011(J)
measurement of, in liquids, 9: 286(J)
measurement of electronic susceptibilities by means of, 9: 3594(J)
method for observing, 9: 2013(J)
probabilities of transition in, related to relaxation time, 9: 6139(J)
proton, detection and measurement, 9: 366(J)
relaxation time of, 9: 7506(J)
review, 9: 7960(J)
rotating magnetic field effects, 9: 5768(J)
transition probabilities in, related to relaxation time, 9: 6547(J)

Nuclear models
alpha-particle, energy levels and nuclear radius of O^{16} from, 9: 357(J)
alpha-particle, energy levels of O^{16*} from, compared with levels from α reactions with C^{12}, 9: 418(J)
alpha particle model of nuclei, 9: 5763(J), 5764(J)
Bohr-Mottielson and optical, study of, 9: 4205(R)

Nuclear models (cont'd)

calculation of Li^8 binding energy using exponential type wave function with central Yukawa interaction, 9: 2442(J)

clouded crystal ball, potentials of, 9: 6550(J)

complex potential, for analyzing neutron scattering at 0 to 30 Mev, 9: 5469(J)

complex square-well, to fit data on elastic scattering of 14-Mev neutrons in Bi, Ta, In, Fe, and S, 9: 6444(R)

composite shell and drop model, failure of transformation of coordinates to lead to desired Hamiltonian, 9: 6447(J)

compound, development of theory of, 9: 7585(J)

discussion of, 9: 3620(J)

excitation of heavy nuclei by low-energy protons, 9: 1071

experimental study of statistical, 9: 7144(J)

Fermi gas, for prediction of nuclear potentials in nucleon-nuclear scattering problems, 9: 6503(J)

fission processes according to various, 9: 3791(J)

Goldberger, experimental results for 140-Mev protons on C, N, and O, compared with, 9: 5800(J)

independence of high-energy electron scattering from, 9: 6362(J)

independent-particle, calculation of electric dipole transitions in nuclear photoeffect, 9: 1995(J)

independent-particle, energy eigenvalues for a spherical well in connection with, 9: 7207(J)

independent-particle, many parameter wave functions in, 9: 1695(J)

intermediate coupling, applied to structure of Li^6 and N^{14}, 9: 7119(J)

modifications to explain magnetic moments of conjugate nuclei, 9: 3639(J)

for neutron scattering in 275- to 410-Mev region, 9: 4608(J)

optical-potential complex square-well, adequacy of, for experimental results on neutron interactions with heavy and intermediate nuclei, 9: 386(J)

particle binding energies, and diffuseness of nuclear boundary, 9: 7513(J)

plural-multiple model of high energy meson showers, 9: 5746(J)

properties of, with inter-nucleon forces obeying Hooke's law, 9: 350(J)

representing meson fields as incompressible fluids with nucleonic sources confined to their interiors, 9: 1637(J)

review of recent studies, 9: 3631(J)

spheroidal core, β-decay analysis with, 9: 5828(J)

statistical, for high-energy nucleon-nucleon collisions, 9: 5546(J)

"strong-coupling," for description of scattering and compound nucleus formation in nuclear reactions, 9: 351(J)

theory, 9: 3638(J)

theory of reduced width for collective, 9: 1690(J)

unified model of Bohr and Mottelson, derivation of Hamiltonian of, 9: 6134(J)

Nuclear models (collective)

deuteron stripping, interpretation by, 9: 3707(J)

dynamics of nuclear deformation by, 9: 2894(J)

Nuclear models (drop)

deformation effects on fission asymmetry, 9: 5766(J)

interpretation of fission asymmetry by, 9: 4550(J)

Nuclear models (optical)

analysis of total and differential elastic scattering cross sections for high-energy nucleon scattering by nuclei, 9: 404(J)

applied to π-meson scattering by nuclei in nuclear emulsions, 9: 1142(J)

description of high energy neutron reactions, 9: 5157(J)

polarization of elastically scattered nucleons from nuclei, discussed on basis of, 9: 6457(J)

for proton scattering by oxygen at 14.1 and 9.5 Mev, 9: 6036(J)

scattering of 14-Mev neutrons by, 9: 2474

Nuclear models (shell)

in analysis of γ transitions in (n,γ) reactions, utilization of, 9: 1360(J)

Nuclear models (shell) (cont'd)

analysis of beryllium(Be^9) with, 9: 7510(J)

applied to nuclei with mass 19, 9: 4267(J)

conference on, 9: 3968

development, 9: 5464(J)

deviations in shell filling and level interaction, 9: 6752(J)

exchange moment contributions to nuclear magnetic moment, 9: 7211(J)

filling of, based on nucleon density in nucleus, calculation, 9: 356(J)

independent particle from, departures from, 9: 6049(J)

interparticle forces and configuration mixing, 9: 7209(J)

j-j coupling, deuteron stripping and pickup reactions and, 9: 5468(J)

meson field theory for, from spin orbit coupling, 9: 3701(J)

nucleon interactions calculated by, for nuclei of mass 19, 9: 7515(J)

nuclear structure by, book on, 9: 6446(J)

potentials and nucleon distribution from, 9: 6452(J)

relation to α decay, 9: 1999(J)

stability of ${}_{Z}X^{3Z+1}$ nuclides, 9: 7918(J)

structure in region of photonuclear effect, 9: 7145(J)

unified, basis of, 9: 7976(J)

wave functions for, by variation method, 9: 7586(J)

Nuclear models (spheroidal)

energy levels for, 9: 7210(J)

Nuclear particles

(See also Elementary particles; Nucleons; Radiation.)

angular distribution and correlation of, emitted after nuclear capture of unpolarized particles, 9: 5796(J)

delayed disintegration of a heavy nuclear fragment, 9: 1005(J)

general principles of nuclear theory, 9: 7894(J)

hyperfragments, stability, 9: 7106

interactions and unstable particle production, 9: 5135(J)

masses of, use of range-energy relation to calculate, 9: 6451(J)

production of particles in collisions, theory, 9: 5195(J)

of spin 1, methods for specifying state of polarization of, 9: 4283(J)

Nuclear physics

annual report of Interuniversity Institute of Nuclear Sciences, 9: 2807(J), 2891(J)

bibliographies, 9: 6185, 6186

book, "Annular Review of Nuclear Science", 1954, 9: 3967(J)

book on progress in, 9: 7103(J)

books, 9: 1341(J), 2892(J), 4271(J)

charge independence in, 9: 4862(J)

European Council for Nuclear Research, reports on organization and research program, 9: 4910

general discussion of, 9: 6474

Geneva papers on, summary, 9: 7101(J)

recent developments in, 9: 349(J)

research program and organization of CERN, 9: 4660

research programs in Norway and Sweden, 9: 5207(J)

sources of nuclear energy, review, 9: 6756(J)

survey of recent investigations on structure of elementary particles, heavy mesons and hyperons, pion-nucleon interactions, and mesic atoms, 9: 4548(J)

tables of nuclear data, 9: 3276(J)

textbook on, 9: 6685(J), 7901(J)

theory and development, 9: 7895(J)

theory and practical applications, 9: 7897(J)

theory of cosmic rays, 9: 7830(J)

Nuclear physics conferences

statistical aspects of the nucleus, 9: 5138

Nuclear power
(See also Aircraft reactors; Power reactors.)
applications of, in chemical process industries, engineering aspects and cost factors, 9: 6149(J)
Britain's ten year plan, 9: 3715(J)
British program, 9: 5204(J)
British program for development of, 9: 3356(J)
Canadian, bibliography, 9: 3003(J)
cost factors for Sodium Graphite Reactor, 9: 755(J)
cost factors in, 9: 1642(J)
economic aspects of, compared with power from conventional plants, 9: 5203
economic aspects of, in Canada, 9: 3714
economic factors and heat removal from a nuclear reactor, summary, 9: 5568(J)
estimated growth to 1965, 9: 5205(J)
future aims in use of, 9: 470(J)
future need, capital outlay, and health regulations, 9: 6819(J)
industrial use, 9: 4908
production and utilization, 9: 1701(J)
survey of projected program in the U. S. for 1955-1964, 9: 4909(J)
symposium on, for Australia, 9: 2102(J)
Nuclear power plants
cost factors, 9: 6819(J)
cost factors and cycle analysis, 9: 2
design of Homogeneous Reactor Experiment, 9: 5777(J)
economic study, 9: 7920
gas turbine cycle study, 9: 3288
potential hazards from accidents involving, 9: 2912(J)
site selection and plant layout, 9: 5494(J)
technology and economic aspects, 9: 4424(J)
water purification requirements, 9: 5495(J)
Nuclear properties
of heavy elements, 9: 7103(J)
Nuclear quadrupole resonance
of chlorine and antimony isotopes in solids, 9: 6765(J)
description, experiments, and experimental data, 9: 4332(R)
detection of, influence of magnetic fields on, and study of semi-rotations in the solid state, 9: 7507(J)
magnetic induction effects in, theory and measurement, 9: 3973(J)
probabilities of transition in, related to relaxation time, 9: 6139(J)
spin-orbit and spin-spin interactions in, and effect of semi-rotations on, 9: 7506(J)
transition probabilities in, related to relaxation time, 9: 6547(J)
Zeeman splitting of, 9: 1074(J)
Nuclear reactions
(See also Fission; Spallation; Thermonuclear reactions.)
activation curve and threshold of P^{31} (n,γ) P^{32}, 9: 6082(J)
analysis of $p + p \rightarrow \pi^+ + d$ with polarized neutrons, 9: 7554(J)
angular correlations in $(\alpha,p\gamma)$ and $(d,p\gamma)$, fast coincidence system for, 9: 7875(J)
with charged particles, tabulation, 9: 7904(J)
comparison of N^{14} and proton induced reactions, 9: 1649(J)
complex β transformations of Na^{25} and Al^{25}, 9: 6540(J)
concept of parentage of nuclear states in, 9: 3645(J)
Coulomb corrections and numerical results on (d,p) and (d,n) reactions, 9: 3658(J)
Coulomb functions, graphs, 9: 6502
cross sections for, derivation of, 9: 7969(J)
Nuclear reactions (cont'd)
deuteron, angular momentum coupling in, 9: 5521(J)
deuteron (d,d), branching ratio and cross section, 9: 6492(J)
deuteron (d,p), numerical calculation of angular distributions, 9: 2095(J)
deuteron stripping and pickup, as departure from j-j coupling shell model, 9: 5468(J)
deuteron stripping, interpretation by collective model, 9: 3707(J)
energies of, nomogram for estimating, 9: 2916(J)
energy distribution of products from, 9: 766(J)
excited nuclei from slow-neutron capture, explanation of existence of, 9: 1360(J)
formation of slow nucleons in, theory, 9: 3710(J)
gamma cross sections and proton angular distribution of O^{18} $(\gamma,p)N^{15}$, 9: 6070(J)
gamma (γ,p) and (γ,n) cross section ratio, isotopic spin selection rules applied to, 9: 2450(J)
high-energy, evidence for correlations in ground-state wave function from analysis of, 9: 5467(J)
high-energy neutron, application of nuclear optical model, 9: 5157(J)
interpretation by correlation function, 9: 2915(J)
mass spectrographic analysis utilizing crossed electric and magnetic fields, 9: 4246
matrix elements in, 9: 1423(J)
meson-nucleon reactions, meson production from, 9: 5749(J)
neutron binding energies from (d,p) Q values, 9: 737(J)
neutrons with complex nuclei, theory of, 9: 6440(J)
non-mesonic photo-, initiated by μ mesons, 9: 7884(J)
nomograph for angular distributions in stripping reactions, 9: 4579(J)
in nuclear emulsions produced by 950-Mev protons, 9: 7542(J)
nucleon-nucleon, covariant treatment of, 9: 6552(J)
nucleon-nucleon collision cross sections, calculations of, 9: 7975(J)
occurring in nature, general discussion of, 9: 5950(J)
(p,n), (p,2n), (p,pn), and (p,2p), at 100 Mev, calculation of cross sections, 9: 4553(J)
photo-, formulas for angular distribution, 9: 4647(J)
photo-, nuclear shell model in, 9: 7145(J)
photoproduction of π^- mesons, cross sections, excitation curves, and momentum distributions for, 9: 6736(J)
potential for nucleon-nucleus, 9: 6550(J)
proton (p,n), threshold values of N^{15}, Mg^{26}, Cu^{63}, Cu^{64}, F^{19}, Na^{23}, and Al^{27}, 9: 7551(J)
proton $(p + p \rightarrow \pi + d)$, polarization effects in, 9: 4605(J)
proton polarization in (d,p) reactions, 9: 1647(J)
radiochemical research of transformation products of high-energy bombardment, 280 to 680 Mev, 9: 7941(J)
ranges of P^{32} and S^{35} from reactions $S^{32}(n,p)P^{32}$ and S^{34} $(n,p)S^{35}$, 9: 6083(J)
scattering by tensor forces, 9: 6140(J)
silver chloride emulsion for study of, $Cl^{35}(n,p)S^{35}$, 9: 6489(J)
statistical theory of, experimental check on, 9: 7144(J)
stripping of heavy particles, 9: 7555(J)
table of disintegration energies, 9: 794(J)
theory of the direct interaction in, 9: 2001(J)
transmutation, general description, 9: 3296(J)
Nuclear spectra
conference on, 9: 3968
determination of nuclear structure by study of, 9: 7959(J)
internal conversion in, 9: 6460(J)
quadrupole, of Cl^{35}-labeled 1,2,4,5-tetrachlorobenzene, 9: 7497(J)
Nuclear spin
(See also as subheading under specific isotopes.)

Nuclear spin (cont'd)

analytical representations of, of single variable, 9: 6131

and charge independence of nuclear forces, 9: 7103(J)

coupling with orbit, in meson theory of nuclear forces, 9: 5747(J)

determination of spin-orbit interaction in neutron–α particle scattering, 9: 6795(J)

forces dependent on, to explain favored β transitions from N − Z = 3 nuclei, 9: 6048(J)

incorporation into spin-½ theory by group space of the proper Lorentz group, 9: 7593(J)

interaction with orbit, effect on photonuclear electric dipole absorption, 9: 6133(J)

isotopic spin quantum number for light nuclei, validity of, 9: 1689

precession of, influence in intermediate states of transitions in oriented nuclei, 9: 6470(J)

rotating magnetic field effects, 9: 5768(J)

spin-spin interaction in magnetic properties of molecules, 9: 6438(J)

Nuclear structure

(See also Nuclear models.)

alpha particle model of nuclei, 9: 5763(J), 5764(J)

beta disintegration energy discontinuities, relation to, 9: 6459(J)

binding energies, data from mass spectrographic analyses, 9: 5144(J)

book, survey of nuclear species, 9: 3630(J)

calculation of, from j-j coupling, 9: 355(J)

charge independence in, 9: 4862(J)

discussion and review of current theory, 9: 2906(J)

distribution of nucleon densities and shell structure of nucleus, statistical analysis, 9: 356(J)

effects of, on probability of K capture, 9: 2088(J)

effects of finite nuclear size on bremsstrahlung production, 9: 3623(J)

excitation of heavy nuclei by low-energy protons, 9: 1071

fission asymmetry in deformation of liquid drop model, 9: 5766(J)

isotopic spin and neutron charge in, 9: 5139(J)

for masses 18 and 19, 9: 5465(J)

nuclear photoeffect, collective aspects, 9: 5767(J)

nuclear radius from deuteron stripping measurements, 9: 1997(J)

nucleon displacement in nuclear ground state, determination of, from photon absorption, 9: 1079(J)

reactions of protons with light and medium weight nuclei, graphs of coulomb functions, 9: 6502

relation to thermal-neutron-capture gamma rays, 9: 3621(J)

review of recent studies, 9: 3631(J)

shell model states, departure from, 9: 6049(J)

shell theory of, book on, 9: 6446(J)

strength function of energy levels, determination of, 9: 7125(J)

theory, 9: 3637(J), 3638(J), 7896(J)

Nuclear technology

book, Principles of Nuclear Reactor Engineering, 9: 7535(J)

handbook of new nuclear techniques, 9: 2893(J)

matrix elements in superallowed transitions, 9: 2997(J)

meson, and meson phenomena, 9: 7103(J)

meson, higher order corrections in, 9: 7973(J)

meson, influence of relativistic terms in, 9: 2065(J)

interference between Fermi interactions in forbidden transitions, 9: 7580(J)

meson corrections to electric and magnetic moments of deuterons, 9: 7971(J)

meson-nucleon scattering, renormalization of Tamm-Dancoff theory, 9: 6135(J)

meson potentials in triplet odd state, 9: 4652(J)

Nuclear technology (cont'd)

meson processes for photoproduction of π^0 meson from D_2 and He, 9: 1344(J)

mesons and fields, book, 9: 6745(J)

negative proton production and annihilation, 9: 1345(J)

neutron-electron interaction, calculated by meson, 9: 7214(J)

neutron level width and density of energy levels, relation between, 9: 1070(J)

nonadiabatic treatment of nuclear forces, 9: 7203(J)

nonlinear interactions and nuclear saturation, 9: 5831(J)

nonrelativistic interaction between two nucleons, 9: 5545(J)

nonrelativistic meson theory of, 9: 5826(J)

nuclear binding energy and two-body force, 9: 466(J)

nuclear forces with repulsive cores, study of, 9: 6762(J)

nuclear photoeffect, effect of nuclear compressibility on, 9: 1141(J)

of nuclei with a diffuse surface, 9: 4643(J)

nucleon anomalous moment in a cut-off meson theory, 9: 3348(J)

nucleon Green function in charged, 9: 3708(J)

nucleon-nucleon collision cross sections, calculations of, 9: 7975(J)

nucleon-nucleon scattering differential cross section, formula for, 9: 7500(J)

particle derivation of nuclear rotation properties associated with a surface wave, 9: 1075(J)

pion-nucleon scattering, d-wave phase shifts of, 9: 7204(J)

pion production by nucleon-nucleon, nucleus-nucleon collisions, 9: 7100(J)

probability of particle interactions, effects of oscillation of the meson shell of nucleons on, 9: 458(J)

Nuclear theory

(See also Nuclear models.)

alpha decay theory and a surface well potential, 9: 1125(J)

angular correlations of nuclear radiations, extranuclear effects on, 9: 6445(J)

bound state and low-energy neutron scattering, calculations with given potential, 9: 7502

charge independence for short-lived excited states, 9: 2993(J)

charge independence in nuclear physics, 9: 2529, 4862(J)

classical nuclear potential whose quanta are neutral scalar mesons, use of, application, 9: 4645(J)

collision matrices for the compound nucleus, 9: 1996(J)

in collisions of nucleons with deuterons, 9: 7978(J)

comparison of universal Fermi interaction with experiment, 9: 2530

coupled meson and nucleon fields, lattice space quantization, 9: 2992

cut-off method in meson theory, 9: 4646(J)

current status of meson theory, 9: 1140

development of compound nucleus, 9: 7585(J)

effects of nuclear charge on internally produced pairs, 9: 1076(J)

energy eigenvalues for a spherical well in connection with independent particle model, 9: 7207(J)

evaporation of nucleons from nuclei, 9: 2003(J)

evidence for two-body spin-orbit forces in, 9: 1077(J)

exchange moment contributions to nuclear magnetic moment of modified shell model, 9: 7211(J)

finite source, electromagnetic properties of nucleons in, 9: 7212(J)

forces, discussion of charge independence of, 9: 6452(J)

fourth-order corrections to meson-nucleon scattering in pseudoscalar meson theory, 9: 1662(J)

intermediate coupling meson theory of, 9: 5822(J)

kinematical investigation of S matrix, 9: 4649(J)

properties of transformed nuclear Hamiltonian, 9: 6548(J)

Nuclear theory (cont'd)
pseudoscalar coupling in, effect on single and double pion production, 9: 723(J)
pseudoscalar meson, calculation of nuclear magnetic and electric quadrupole moments with, 9: 367(J)
pseudoscalar meson interactions for systems with spin greater than ½, 9: 2996(J)
pseudoscalar meson theory, 9: 1144(J), 2827, 5747(J)
pseudoscalar meson theory and solution of the deuteron problem, 9: 5756(J)
pseudoscalar meson theory applied to Li^8, 9: 5824(J)
pseudoscalar meson theory of, applied to damping of pair formation, 9: 5825(J)
pseudoscalar meson theory of, derivation of nucleon coupling constant from, 9: 5823(J)
pseudoscalar with pseudoscalar coupling, dissociation parameter, 9: 2089(J)
pseudoscalar with pseudovector coupling, divergences in, 9: 2090(J)
quadrupole moments of odd nuclei, calculations of, 9: 7208(J)
quasi-bound states of pion-nucleon system in Tamm-Dancoff approximation, 9: 7215(J)
relations between cross sections, derivation of, 9: 7969(J)
saturation of nuclear force by meson-meson interaction, 9: 337(J)
scattering problems, meson theory, review of, 9: 6753(J)
shell, development, 9: 5464(J)
shell structure, 9: 1640(J)
single meson production, nonrelativistic model for, 9: 7588(J)
spin-orbit coupling and mesonic Lamb shift in, 9: 3701(J)
statistical, 9: 2000(J), 6754(J)
statistical, equations for, 9: 6755(J)
statistical aspects of the nucleus, conference on, 9: 5138
statistical factors in nuclear electromagnetic transitions, 9: 812
symmetry in theory of elementary particles and nuclear processes, review, 9: 5196(J)
symposium on nuclear forces, Amsterdam, 1954, 9: 7102(J)
Tamm-Dancoff methods and nuclear forces, 9: 1696(J)
two-body forces and nuclear saturation, 9: 462

Nuclei
(See also subheadings under specific elements and isotopes for nuclear properties and reactions.)
absorption of π mesons by heavy, 9: 1385(J)
alignment of, electric hfs method for, experimental and theoretical considerations, 9: 365(J)
alkali metals, nuclear spin relaxation in, 9: 5771(J)
alpha disintegration energy for heavy, formula, 9: 3692(J)
alpha-γ directional correlations, increased efficiency with liquid film sources, 9: 321(J)
alpha particle model of, 9: 5763(J), 5764(J)
average potentials and densities, 9: 4269(J)
binding energies of, containing a bound hyperon, 9: 7518(J)
capture of unpolarized particles by, formulas for angular effects of emitted radiations after, 9: 5796(J)
charge, effect on internally produced pairs, 9: 1076(J)
charge and mass distribution in, 9: 7138(J)
charge distribution of, 9: 6040(J)
classification of nucleonic states in deformed, 9: 7527(J)
collision alignment in transmitted beams, 9: 5753(J)
collision of high-energy mesons, protons, and α particles, 9: 1667(J)
complex, elastic scattering of polarized protons from, 9: 4885, 4893(J)
containing hyperon, disintegration of, 9: 7476(J)
Coulomb excitation, 9: 1067(R)

Nuclei (cont'd)
Coulomb excitation by charged particles, 9: 4903(J)
decay selection rules, 9: 5456(J)
decay spectra, rotational level effects, 9: 7576(J)
deuteron interactions, theory, 9: 7541(J)
deuteron stripping on targets of heavy, 9: 7520(J)
disintegration energies, table, 9: 794(J)
distribution of protons in heavy atomic, 9: 6802(J)
elastic scattering of α and d by heavy, 9: 7511(J)
elastic scattering of electrons by atomic, 9: 5523(J)
elastic scattering of neutrons by moving, 9: 1115(J)
elastic scattering of nucleons by, theory of polarization, 9: 3314(J)
electric field of, evidence of γ scattering by, 9: 6043(J)
electron scattering at high energies, nuclear dispersion contribution to, 9: 4603(J)
electron scattering by polarized, 9: 2049(J)
electrons scattered by fields of, radiative correction to high-energy, 9: 7177(J)
energy bonds of, review, 9: 744(J)
energy levels, spacings and neutron widths of, 9: 6045(J)
energy levels in spheroidal, 9: 7210(J)
energy levels of light nuclei from He^5 to Ne^{23}, 9: 3628(J)
evaporation of nucleons from, 9: 2003(J)
even-even, characteristics of second excited states in region $36 \leq N \leq 88$, 9: 4270(J)
excitation of heavy, by low-energy protons, 9: 1071
excitation of rotational levels in α decay, 9: 6801(J)
excited by monoenergetic protons, emission of α particles from, 9: 2917(J)
excited states of even-even, 9: 1638(J)
excited states of, from $Z = 60$ to $Z = 92$ and $Z = 22$ to $Z = 48$, 9: 7534(J)
evidence for two-body spin-orbit forces in, 9: 1077(J)
gamma absorption, 9: 4006(J)
gamma scattering by electric fields of, 9: 4610(J)
gamma transition lifetimes, measurement by recoil methods, 9: 2877(J)
ground state wave function, correlations in, from analysis of high-energy reactions, 9: 5467(J)
half-life distribution table of radioactive, 9: 7570
half life for low activities of short-lived, calculation, 9: 4023(J)
half life of radioactive, determinations with small samples, 9: 4331(J)
heavy, production and scattering of polarized neutrons from, 9: 425(J)
heavy, spin-orbit coupling and density distribution in, 9: 7913(J)
incoherent scattering cross sections, theory of, 9: 5795(J)
inelastic electron scattering by, nuclear multipole transitions in, 9: 785(J)
inelastic p-p polarization and nucleon momentum distribution in, 9: 7135(J)
intermediate and heavy, comparison of experimental and theoretical results on neutron interaction with, 9: 386(J)
intermediate coupling in odd-odd, 9: 7119(J)
internal bremsstrahlung in 0--0 transitions, 9: 5140(J)
internal conversion coefficients for K shell, threshold values, 9: 5462(J)
internal conversion in L and M subshells, 9: 4552(J)
interparticle forces and configuration mixing in, 9: 7209(J)
in isobaric sequences, masses, 9: 5466(J)
isobaric spins and congruent states, review, 9: 1998(J)
isobaric states, application to meson photoproduction, 9: 2883(J)
isotopic spin of light, review, 9: 4866(J)
light, optical model study of meson scattering by, 9: 4604(J)
low-lying states of spin 1- in even-even, 9: 1633(J)
magnetic moments and configuration mixing of odd, 9: 3634(J)

Nuclei (cont'd)
magnetic shielding of, in molecules by a variational method, 9: 3629(J)
of mass 18 and 19, structure of, 9: 5465(J)
mass 19, interactions between 3 nucleons in 1d, 2s shell, 9: 7515(J)
masses of light, method of correcting table of, 9: 7120(J)
masses of light, tables, 9: 3277(J)
mean free path of slow neutrons in, near A = 150, 9: 4313(J)
μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)
meson scattering by, magnetic effects, 9: 1109(J)
microwave spectroscopy, review, 9: 3971(J)
multiple Coulomb scattering from extended, 9: 775
natural science of nuclides, general discussion, 9: 5950(J)
neutron absorption widths in semitransparent model of, 9: 5155(J)
neutron and proton distributions in heavy, 9: 7146(J)
neutron binding energies of, determined from (d,p) Q values, 9: 737(J)
neutron capture cross section relationship to binding energy of captured neutron in trans-lead, 9: 6033(J)
neutron-deficient chains in noble metal region, 9: 5534(J)
neutron resonance width variations, 9: 4039(R)
neutron scattering, polarization at high energies, 9: 4311(J)
neutron widths and density of levels, relation between, 9: 1070(J)
nonlinear interactions in heavy, 9: 5831(J)
nonspherical, scattering of fast neutrons by, 9: 6814(J)
nuclear magnetic moment, correction terms in calculation, 9: 746(J)
nuclear photoeffect, collective aspects, 9: 5767(J)
nuclear temperatures, hypothesized to be constant, 9: 5757(J)
nucleon cross sections at cosmic-ray energies, 9: 5488(J)
nucleon forces in, repulsive, 9: 6762(J)
nucleon interactions, "giant resonance" interpretation of, 9: 4551(J)
nucleon-nucleus potential at high energies, 9: 3618(J)
odd-odd, nuclear magnetic moment of, calculated by proton-neutron coupling, 9: 742(J)
orientation, extent of, 9: 5141(J)
orientation at low temperatures, 9: 6469(J)
oriented, angular correlation parameters, 9: 4558(J)
oriented, angular distribution of radiations emitted by, 9: 6470(J)
oscillation of, calculation of, by Thomas-Fermi method, 9: 457(J)
Overhauser polarization effect and minimum entropy production, 9: 5773(J)
of paramagnetic materials, Overhauser effect in, 9: 5772(J)
photon absorption by, harmonic mean energy for, 9: 1079(J)
photon absorption cross section for, calculations of, 9: 7528(J)
polarization, Overhauser effect in, 9: 5760(J)
polarization by electron resonance saturation, 9: 1635(J)
polarization by microwaves, 9: 3971(J)
polarization in nucleon scattering by complex, 9: 3316(J)
polarization of neutrons by O_2 and heavy, 9: 6031(J)
polarization of nucleons elastically scattered from, 9: 3680(J)
potentials of, in nucleon-nuclear scattering problems, 9: 6503(J)
properties, conference on, 9: 3968
properties and transformations, tables, 9: 7904(J)
proton cross sections (p,pn) and (p,2n) in medium weight, 9: 7122(J)
proton cross sections, (p,pn) + (p,2n) and (p,2p), in medium weight, 9: 7123(J)
proton fission of, in mass range 61 to 131, energy dependence, 9: 7553(J)
quadrupole moments of odd, calculations of, 9: 7206(J)
quasi-bound states of pion-nucleon system in Tamm-Dancoff approximation, 9: 7215(J)

Nuclei (cont'd)
radii of, determination of, 9: 7191(J)
radioactive, spectroscopy of fluorescent radiations from, 9: 6473(J)
reduced width of energy levels in, theory, 9: 1690(J)
relaxation time of, relation to probabilities of transition in nuclear resonance (magnetic and quadrupole), 9: 6139(J), 6547(J)
resonance fluorescence in, interpretation of, in presence of branching or internal conversion, 9: 7504(J)
resonance of protons in liquid molecules, 9: 1639(J)
resonance scattering of γ rays by, 9: 783(J)
s shell radiation from light, 9: 4868(J)
scattering of fast neutrons and protons by, 9: 3681(J)
scattering of fast nucleons by relation of polarization and spin-orbital coupling to angular dependence of, 9: 5174(J)
scattering of high-energy electrons and positrons by, 9: 3671(J)
scattering of nucleons by, polarization and spin orbital coupling effects, 9: 7596(J)
scattering of 340-Mev protons by subshells in light, 9: 2444(J)
self-conjugate, gamma reactions (γ,p) and (γ,n), yield ratios, 9: 3300(J)
self-consistent fields for, equations for, by calculation of electrostatic force, 9: 456(J)
shell structure, theory, 9: 1640(J)
shell theory for, with A = 19, 9: 4267(J)
size of, from neutron total cross section measurements, 9: 5487(J)
spin coupling of, effects of perturbing r-f fields on, 9: 3636(J)
stability of $_{Z}X^{8Z+1}$, 9: 7918(J)
stripping, other than deuteron, 9: 7555(J)
surface energy and diffuseness of nuclear surface, 9: 4268(J)
surface oscillations, relation to single nucleon excitation, 9: 7501(J)
table of α-decay energies for heavy, 9: 806(J)
theory of the direct interaction in reactions of, 9: 2001(J)
total and differential elastic scattering cross sections for high-energy nucleons, optical-model analysis of, 9: 404(J)
wave numbers of Kα satellites in, from Z = 19 to 42, 9: 4341(J)

Nuclei (cells)
growth and effects of irradiation on, theory, 9: 6563

Nucleic acids
aqueous solutions of, effects of x radiation, 9: 5615(J)
biosynthesis of, effects of radiation on, in chick embryos, 9: 4691
of carcinoma cell suspensions, effects of radiation, 9: 1718(J)
coliphage, linkage of glucose in, 9: 870(J)
incorporation of adenine into, effects of tumor growth, x radiation, and 8-azaguanine on, in mice, 9: 1449(J)
incorporation of adenine into, tracer study, 9: 2608, 3377
incorporation of formate into components of, effects of infected bone marrow in rats, tracer study, 9: 1176
irradiation of, biochemical processes following, 9: 7615(J)
metabolism of, tracer studies, 9: 4911(R)
solutions of, effects of x and ultraviolet radiation, 9: 5291(J)
of thymic cells, effects of irradiation on, in mice, 9: 2558(J)

Nucleon showers
penetrating, production in Li, C, Al, and Pb, 9: 1926(J)

Nucleons
(See also Neutrons; Protons.)
absorption reaction of fast charged hyperon with, 9: 3611(J)
classification of decay and production processes of, 9: 7521(J)
collision of, production of mesons by, 9: 1338(J)
collisions with deuterons, 9: 7978(J)

Nucleons (cont'd)
collisions with nucleons, calculation of cross sections for, 9: 7975(J)
collisions with nucleons, double production of pions, 9: 5750(J)
collisions with pions, γ rays from, 9: 2032(J)
collisions with pions, multiple production of pions from, 9: 793(J)
density distribution of, in nucleus, calculation, 9: 356(J)
dimensions, 9: 6759(J)
effective mass in nuclei, 9: 7893(R)
elastic scattering by nuclei, theory of polarization, 9: 3314(J)
elastic scattering of, review of, 9: 6753(J)
electromagnetic properties of, in a finite source theory, 9: 7212(J)
gamma scattering by, calculation of cross section for, 9: 426(J)
high energy scattering of, 380 to 660 Mev, 9: 7908(J)
hyperons as excited states of, 9: 5451(J)
interaction between, in nuclear shell model, 9: 7209(J)
interactions between configurations of 3, in 1d, 2s shell, 9: 7515(J)
interaction coupling theory with mesons, 9: 1630(J)
interaction of, with mesons, S matrix for, 9: 335(J)
interaction with K particles, 9: 7475(J)
interactions of cosmic radiation underground with, cross sections for, 9: 1006(J)
interactions of free, theory, 9: 2091(J)
interactions with mesons, Λ° production from, 9: 1986(J)
interactions with mesons, theory, 9: 330(J)
interactions with π mesons, approximate treatment, 9: 2083(J)
interactions with π mesons, review in Annual Review of Nuclear Science, 9: 4008(J)
interactions with nuclei, giant resonance interpretation in, 9: 4551(J)
magnetic moments, Sachs' theorem on, 9: 3706(J)
mass determination of minimum ionization of, in nuclear emulsions, 9: 5733(J)
mass difference theory, 9: 1078(J)
meson interactions, asymptotic Green function in pseudoscalar theory, 9: 7597(J)
meson interactions, theory of indirect, 9: 7483(J)
meson (μ) interaction cross section, 9: 7832(J)
meson-nucleon scattering S matrix expressed in Heisenberg representation for, 9: 3704(J)
meson production by, multiple, 9: 7482(J)
meson (π) production by, role of isobaric states during, 9: 7489(J)
meson production by proton collisions, 9: 1069(J)
meson scattering and photomeson production, 9: 2044(J)
meson scattering by, Tamm-Dancoff theory of, renormalization in, 9: 6135(J)
momentum distribution and inelastic p-p polarization, 9: 7135(J)
nonrelativistic interaction between two, 9: 5545(J)
nuclear total scattering cross sections for, theory, 9: 3673(J)
nucleon collisions with, secondary particles in, 9: 7417(J)
nucleon-nucleus potential at high energies, 9: 3618(J)
nucleon reactions at high energies, statistical models for, 9: 5546(J)
pair formation, damping of, 9: 5825(J)
phase shifts for nucleon-nucleon scattering at 280 Mev, 9: 788(J)
photon scattering by, calculation of cross section from experimental photomeson production cross section, 9: 405(J)
pion scattering of, d-wave phase shifts of, 9: 7204(J)
polarization in nucleon-nucleon scattering, formula, 9: 786(J)
polarization in scattering by complex nuclei, 9: 3316(J)
polarization of elastically scattered, 9: 2099(R), 3680(J), 6457(J)
reactions with nuclei at cosmic-ray energies, cross sections, 9: 5488(J)

Nucleons (cont'd)
rest energy of, derivation of coupling constant from, 9: 5823(J)
scattered by π mesons, pseudoscalar theory applied to, 9: 7213(J)
scattering by antinucleons, cross sections and vacuum polarization of, 9: 1661(J)
scattering by mesons, fourth-order corrections to, in pseudoscalar meson theory, 9: 1662(J)
scattering by nucleons, amplitudes in, 9: 3312(J)
scattering by nucleons, formula for differential cross section in, 9: 7500(J)
scattering by nucleons, polarization and amplitudes in, 9: 3313(J)
scattering by pions, theoretical analysis of, 9: 403(J)
scattering by pions in Tamm-Dancoff approximation, 9: 4650(J)
scattering cross section angular dependence, relation to polarization and spin-orbital coupling, 9: 5174(J)
scattering of electromagnetic waves by, classical treatment of, 9: 4618(J)
scattering of fast, by nuclei, 9: 3681(J)
scattering of π mesons by, theory, 9: 329(J), 722(J), 2034(J), 6449(J)
scattering of π mesons by unpolarized, invariant transformation cross sections in, 9: 7205(J)
scattering of polarized beams of, 9: 4304(J)
scattering theory, relation to polarization and spin-orbital coupling, 9: 7596(J)
slow, formation in nuclear reactions, 9: 3710(J)
space distribution in shell model of nucleus, 9: 6452(J)
spin orbit coupling in pseudoscalar meson fields, theoretical determination, 9: 3701(J)
statistical treatment of, 9: 6755(J)
strong coupling with meson fields, theory, 9: 1421(J)
tensor forces dependent on velocity of, 9: 815(J)
total and differential elastic scattering cross sections for high-energy, by nuclei, optical-model analysis of, 9: 404(J)

Nucleotides
(See Nucleic acids.)
aqueous solutions of, effects of x radiation, 9: 5615(J)

Nucleotides, desoxy-
synthesis of, in the evolution of biological systems, 9: 7224

Nutrients
distribution of, in soils, tracer studies, 9: 7667(J)

○

Oak Ridge National Lab., Tenn.
progress reports of Instrumentation and Controls Division, 9: 4842(R)
progress reports of Mathematics Panel, 9: 2845(R)
progress reports of Solid State div., 9: 5382(R)
progress reports of the Physics Div., 9: 1067(R)
progress reports on radioisotope production, 9: 4504(R)

Oak Ridge School of Reactor Technology, Tenn.
course outlines and engineering problems, 9: 5833
reactor physics laboratory manual, 9: 6086

Oats
beta radiation effects in various growth stages, 9: 6830(J)

Octanoic acid
(See Caprylic acid.)

Octic acid

(See Caprylic acid.)

Ohio (Cuyahogo Co.)

occurrence of Ge and U in coalified wood from upper Devonian blackshale in, 9: 6277(J)

Ohmart Corp., Cincinnati

progress reports on development of nuclear batteries, 9: 3548(R), 3549(R), 3550(R)

Oil deposits (Kan.)

radioactivity in, 9: 1517(J)

Oiler Tunnel (Utah)

mineralogy, 9: 1829

Oils

physical properties, 9: 6882(R)

Old Dad Prospect (Nev.)

thorium and U distribution, 9: 1260(J)

Onions

effects of γ radiation on storage life, 9: 3735(J)

Optical materials

preparation of silver chloride crystals, 9: 7029(J)

transparent solids, properties, 9: 5380

Optical systems

(See also specific instruments, e.g., Microscopes; see also Remote-viewing equipment.)

for adjustment of the skin distance for in vivo measurements of radioactive isotopes, design, 9: 688(J)

for colloidal particle size measurement, 9: 6423(J)

design of, for use in photometer, 9: 4215

design of, for viewing 2000-C Co^{60} source, 9: 7390

method for bonding optical glass parts to metal mounts, 9: 4123

random light in, 9: 6380(J)

Orange Cliffs Quadrangle (Utah)

photogeologic map of, 9: 5005(J)

Orange Hill (Alaska)

geology, 9: 628(J)

Oregon State Coll., Corvalis

progress reports on the luminescence of alkali halides by heavy metals, 9: 1784(R)

Ores

(See also specific minerals, e.g., Monazites; see also specific ores, Thorium ores; see also Minerals.)

distribution and origin of lead isotopes in, 9: 7776(J)

flotation of, review, 9: 3161(J)

geochemistry techniques in detecting of deposits of, 9: 6962

paper chromatographic determination of trace metals in geochemical prospecting of, 9: 2264(J)

spectrographic analysis of, for minor elements, 9: 162

spectrophotometric analysis of, for Nb, Ta, and Ti, 9: 3405(J)

Organic acids

(See also specific organic acids.)

radiation decomposition of, 9: 102

Organic chemistry

reaction mechanisms for acid decarboxylation, 9: 5883(J)

Organic compounds

(Specific organic compounds are indexed according to precedents found in such standard reference works as Chemical Abstracts, Handbook of Chemistry and Physics, Biological Abstracts, etc.)

adsorption on Ag and Cu from aqueous solutions as inferred from H_2 overvoltage measurements, 9: 595(J)

Organic compounds (cont'd)

C^{14}-labeled, correction factors for comparing activities of, assayed in a flow proportional counter, 9: 4853(J)

chemical reactions, review, 9: 3062(J)

heat transfer coefficient measurement of, design of apparatus for, 9: 3132(J)

infrared spectra of gaseous, adsorbed on microporous glass, 9: 7732(J)

labeled, catalog of, 9: 246(J)

mechanism of reactions in, tracer studies, 9: 6206(J)

phosphorescence of, effects of structure on, 9: 3759(R)

as precipitating agents, 9: 7704(J)

preparation of labeled, using recoil tritons, 9: 4759(J)

radiation decomposition of, 9: 102

radiation effects on, including degradation, polymerization, and optical changes, 9: 7308(J)

radioassay of C^{14}-labeled, accuracy, 9: 6197(J)

semimicro determination of F, Cl, and N in, 9: 2166(J)

sensitized phosphorescence of molecules of, at low temperatures, 9: 7495(J)

of sulfur, volumetric microdetermination of S in, 9: 80(J)

suitability for radiochemical operations, effects of corrosive atmospheres, temperature variables and radiation on, 9: 107

vapors of, fluorescence, 9: 6191(J)

wetting properties on high-energy surfaces, 9: 6596

Organic compounds, metallo-

chemistry, review, 9: 6893(J)

of fluorine, chemistry of, 9: 893(J)

thermal decomposition, 9: 3805(R)

thermal stability, 9: 4421

viscous properties, 9: 5681(R)

Organisms

measurement of radioactivity in, in vivo, 9: 5121(J)

Organs

(See also specific organs.)

permissible limits of radioactive materials, validity of "critical organ" concept for, 9: 5863

weight, effects of exposure to total-body x radiation on, in rats, 9: 4676(J)

ORNL reactors

(See Bulk Shielding Facility; Homogeneous Reactor Experiment; Homogeneous Reactor Test; Materials Testing Reactor Mockup; Tower Shielding Facility.)

Oscillators

(See also Microwave oscillators; Oscillographs; Pulse generators (electronics); Reactor oscillators.)

circuit design of, handbook of piezoelectric crystals for, 9: 6689

design, 9: 1579(R)

frequency and circuits for synchrotrons, 9: 392

klystron, automatic control system for, 9: 8018(P)

measurement of resonant frequency of a cavity by, crystal-controlled, 9: 7429

nuclear magnetic resonance apparatus for production of frequencies, 9: 353

radio-frequency, for determination of alkali, design, 9: 5285

spin-controlled, frequency generated by, 9: 7163

voltage stabilized, design, 9: 5561(P)

Oscillographs

automatic record reading systems for, 9: 7845(J)

photoelectric comparator for measuring oscillograms, 9: 279(J)

recording, design and performance of, for the mμsec region, 9: 288

sources of error in recording high surge voltage with cathode ray, 9: 7434(J)

Osmium
determination of, as sulfide, 9: 82(J)
intermetallic compound with Nb, preparation and structure, 9: 3878(J)
natural radioactivity, 9: 804(J)
preparation of 6-hr., by 70-Mev bremsstrahlung irradiation, 9: 7105
Szilard-Chalmers effect, 9: 7105

Osmium chelates
preparation and chemical properties, 9: 512

Osmium complexes
with bypyridine, chemical properties, 9: 512

Osmium fluorides
preparation of complex, 9: 2188(J)

Osmium isotopes
Szilard-Chalmers concentration, 9: 1959(J)

Osmium isotopes Os^{184}
decay, 9: 6530(J)

Osmium isotopes Os^{187}
nuclear spin and magnetic moment, 9: 5480(J)

Osmium isotopes Os^{191}
decay scheme, 9: 7105
production of, from 70-Mev irradiation of Ir, 9: 7105

Osmium isotopes Os^{192}
energy levels and γ spectra, 9: 4333

Osmium–uranium alloys
crystal structure of UOs_2, 9: 6944(J)

Osmosis
electro-, in paper electrochromatography with electrode vessels, 9: 1220(J)
electro-, of lactic acid solutions in paper electrochromatography with electrodes on paper, 9: 1221(J)

Ovaries
(See Gonads.)

Ovens
(See also Furnaces; Kilns.)
single crystal temperature controlled, for x-ray spectrometer, design, 9: 1028(J)

1,3,4-Oxadiazoles, 2,5-diaryl-
preparation, 9: 3773(J)

Oxalic acid
decomposition by γ radiation of, and possible use as dosimeter, 9: 8929(J)

Oxazoles, 2,5-diaryl-
preparation, 9: 3773(J)

Oxidation
(See also High-temperature oxidation.)
design and performance of equipment for, of sphalerite, 9: 3381
of high-purity nickel, effect of time, temperature, and surface treatment on, 9: 2306(J)
inorganic oxidation-reduction reactions involving electron transfer, discussion of, 9: 6892(J)
isotope effect of O^{18} in, of copper, 9: 850
of metals and alloys, review, 9: 3206(J)
of methionine in biological systems, hydrogen isotope effect in tracer studies, 9: 6607(J)
radioinduced, 9: 1215(J)
radioinduced, asymmetry of action of H and OH radicals in, 9: 1216(J)

Oxide coatings
(See also specific oxide coatings.)

Oxide coatings (cont'd)
on aluminum alloys, effects on properties, 9: 3519

Oxide films
(See also specific oxide films.)
examination by reflection electron microscopy, 9: 3536(J)
formation kinetics of, on metals, 9: 638
formation on Cr and Cr–Ni steels, x-ray diffraction analysis, structure, and properties, 9: 949

Oxides
(See also specific oxides.)
double, of transition metals, preparation and fluorite structures of, 9: 857(J)
effects as additives on alkali-activated water gas process, 9: 4931
energy loss of 22-kev electrons, 9: 1665(J)
heat and free energy of formation of metal, 9: 529(J)
lung deposition and biological effects of, when combined with rare earths, in guinea pigs, 9: 7255(J)
wettability of high-energy surfaces, 9: 6596

Oxime complexes
with nickel(II) and palladium(II), magnetic studies of, 9: 2155(J)

Oxyfluorides
(See also specific oxyfluorides.)
preparation of metallic, 9: 1426(P)

Oxygen
activated adsorption on pyrolytic nickelous oxide, 9: 65
adsorption of, by graphite at low temperatures, 9: 4399(J)
atomic form factors, calculation and survey, 9: 7407(J)
chemical determination in Ca, 9: 3070
chemisorption of, on Ti, 9: 7788
chemisorption on UO_2–ThO_2 solid solutions, 9: 603(J)
collision processes of 14- to 41-kev O ions in, 9: 7566(J)
combustion determination of, in Ti and Ti alloys, 9: 1197
content in Na and NaK in Ni and stainless steel loops from 200 to 1000°F, 9: 4179(R)
continuous detection and measurement of low concentrations of, in N_2, He, and A by dew-point method, 9: 2636(J)
cross sections and angular distributions for neutron scattering on, 9: 6029
decomposition, ozone formation, and isotopic exchange, kinetics, 9: 6874
depolarization, in metal corrosion, 9: 4143(J)
design and performance of apparatus for continuous detection and measurement of low concentrations of, in gases by dew-point method, 9: 2636(J)
determination in metals, 9: 5609(J)
determination in Na and NaK alloys, 9: 7700(J)
determination in U, 9: 7288
determination of, 9: 52
determination of, in O_2-enriched air, survey of methods, 9: 77
dielectric constants, 9: 4700
diffusion of, in Ti, 9: 2339(J)
disintegration by 300-Mev neutrons, 9: 2890(R)
effects on corrosion of metals in NaK, 9: 4179(R)
effects on frequency of x-ray induced mutations in eggs of Habrobracon, 9: 2592(J)
effects on mass transfer of stainless steel components in liquid Na at 925°F, 9: 3827
effects on properties of Ti alloy welds, 9: 226(J)
effects on radiation injuries in seed of barley, 9: 2593(J)
effects on radioinduced chromosome aberrations in Tradescantia, 9: 3020(J)

Oxygen (cont'd)
electric breakdown processes in, 9: 2377(J)
electrochemical determination of traces of, in nitrogen or other gases, 9: 2631
electrochemical liberation of, on nickel electrodes, 9: 6190(J)
energies of K transitions of π-mesonic x rays from, 9: 1909(J)
energy required to produce one ion pair, 9: 5702(J)
exchange between $CaCO_3$ and H_2O in geological thermometers, 9: 5000(J)
gamma reactions (γ,p), fine structure in, 9: 4577(J)
heat of vaporization, calculated values of, 9: 1789
high-tension, effects on development of pupae of Habrobracon, 9: 1729(J)
interaction with clean metal surfaces, 9: 2159(J)
ion pair formation, 9: 4039(R)
isotopic content of atmospheric, in air and ocean water, 9: 662(J)
isotopic equilibration determination of, in O systems of Cu, Fe, Cr, Ti, and oxides of Cu, Fe, and Zr, 9: 3394
isotopic exchange between MnO_2 and O_2 or water vapor, 9: 5254(J)
isotopic exchange of, in acids and salts, 9: 7713(J)
isotopic exchange reaction between molecular and atomic, 9: 860(J)
magnetic scattering of slow neutrons by, 9: 4587(J)
magnetic scattering of slow neutrons from molecular gaseous, 9: 2487(J)
mass spectra of O^{18}-labeled, 9: 5998(J)
mass-spectrometric determination in water, 9: 6723(J)
melting curves for, 9: 6746(J)
μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)
π-mesonic atoms of, x radiation from, 9: 7082(J)
negative-ion electron photodetachment cross section, 9: 7838(J)
neutron scattering at 14 Mev, 9: 6030
neutron total cross section at high energies, 9: 4004(J)
neutron total cross sections, 9: 1107, 7124(J)
nuclear disintegration of, by neutrons, 9: 378
nucleon total scattering cross sections, 9: 3673(J)
oxidation of U oxides in H_2O suspension with, 9: 7317
photochemical reactions, 9: 2612
photoionization efficiencies and cross sections in, 9: 6747(J)
photoproton spectrum, fine structure in, 9: 7134(J)
preparation of radiation targets of NiO by heating Ni foils in presence of, 9: 242(J)
proton-proton coincidences in, produced by 340-Mev γ rays, 9: 7556(J)
proton reactions at 140 Mev, 9: 5800(J)
proton scattering at 14.1 and 9.5 Mev, optical model for, 9: 6036(J)
proton total cross sections, 9: 2458
proton total cross sections at 208 and 315 Mev, 9: 358(J)
recombination, from homogeneous reactors, 9: 754(J)
reduction of, effects on radiosensitivity of yeast and bacteria, 9: 6581(J)
resonances in elastic scattering of proton on, 9: 6059(J)
separation from A and N by hot metals, 9: 2382
separation of Ti from, by vacuum sublimation, 9: 2209(J)
sorption on evaporated Ni films, 9: 3112(J)
stopping of deuterons in, 9: 5803(J)
tension, effect on radioinduced chromosome breakage in Tradescantia, 9: 5859(J)
tension, effects on radiation injuries in Paramecium, 9: 4672(J)
thermodynamic properties, effect of dissociation on, 9: 7840
transfer of, between CO_2 and CO in presence of different carbons from 650 to 900°C, 9: 526(J)
tritium and neutron production from, by 2.2-bev protons, 9: 2922(J)
ultraviolet emission by α bombardment, 9: 3241(J), 5405(J)
virial coefficients, 9: 3081

Oxygen–aluminum–titanium systems
mechanical properties, 9: 3854(R), 4789(R)
tensile properties and microstructure, effects of heat treatment on elevated-temperature, 9: 2719(R)

Oxygen–boron hydride systems
explosive limits, 9: 4699

Oxygen–carbon–titanium systems
mechanical properties, microstructure, and phase studies, 9: 1870(J)

Oxygen–chromium systems
chemical properties, hardness, phase studies, and preparation, 9: 6200
isotopic equilibration determination of O in, 9: 3394

Oxygen–chromium–titanium systems
corrosion, impact tests, mechanical properties, phase studies, properties, and x-ray diffraction analysis, 9: 5654(R)
oxidation resistance, hardness, and tensile strength, 9: 4791(R)
phase studies, 9: 1874(J)

Oxygen–copper systems
isotopic equilibration determination of O in, 9: 3394

Oxygen–formic acid systems
radiation chemistry, 9: 6868

Oxygen–hydrogen systems
chemical interactions, effect of C_3H_8 on, 9: 7274
chemical reactions in corrosion loops, kinetics, 9: 6477
effect of burner tip temperature on flash-back of flames of, 9: 4706

Oxygen ions
charge distribution of, passing through gases, 9: 5807(J)
distribution of charge after passage through matter, 9: 5175(J)
ground state energy, 9: 5751(J)
negative, production by collision of 14- to 41-kev positive O ions in H_2, O_2, and N_2, 9: 7566(J)

Oxygen–iron systems
isotopic equilibration determination of O in, 9: 3394
surface tension, 9: 2702(R)

Oxygen–iron–titanium systems
phase studies, 9: 1874(J)

Oxygen isotopes
height and geographical distribution, 9: 2130
thermonuclear reactions of protons with, in stars, 9: 3647(J)

Oxygen isotopes O^{15}
decay and half lives, 9: 1680(J)
half life, 9: 2951
production of, by N^{14} proton capture, cross section for, 9: 6071(J)
production of, by 0.4- to 3.0-Bev proton bombardment of Al, cross sections for, 9: 6074(J)

Oxygen isotopes O^{16}
bombardment of aluminum with, Cl^{38}/Cl^{34} ratio from, 9: 6081(J)
deuteron reactions (d,p), 9: 1393(J), 4894(J)
deuteron reactions (d,p), angular distribution of protons from, 9: 5151(J), 7902
deuteron reactions (d,p) at 0.60 to 1.45 Mev, angular distributions, 9: 4293(J)
deuteron reactions (d,p)O^{17} and (d,p)O^{17*}, differential cross sections for, 9: 4573(J)
electric monopole transitions in, 9: 5479(J)
electron pairs from 6.05-Mev excited level of, 9: 7909(J)
electron pairs from monopolar ray of, coincidence circuit for detection of, 9: 7465(J)
electron pairs from monopole transition of, angular correlation of, 9: 6365(J)

Oxygen isotopes O^{16} (cont'd)
energy level at 14.7 Mev, lowest state of surface oscillation of, 9: 7509(J)
energy levels, 9: 1349(J)
energy levels and nuclear radius of, from α-particle model, 9: 357(J)
energy levels from α bombardment of C^{13} compared with predicted levels from α-particle nuclear model, 9: 418(J)
expansion of a shell in, by p nucleons, 9: 4867(J)
gamma rays from inelastic scattering of 14-Mev neutrons on, 9: 6758(J)
gamma reactions (γ,α) and excited states, 9: 1116(J)
gamma reaction (γ,α) cross sections, 9: 6484
gamma reactions $(\gamma,n\alpha)$ and (γ,t), 9: 3674(J)
gamma reactions (γ,p) and (γ,n), yield ratios, 9: 3300(J)
half lives of excited states, measurement, 9: 2877(J)
neutron reaction (n,p) cross section, 9: 7957
neutron reactions (n,α), 9: 6439(J)
photoproton production from, by 13.5- to 18.7-Mev γ rays, 9: 6070(J)
in reaction $O^{18} + p \rightarrow p + 4\alpha$, 9: 6069
triton reactions (t,n), excitation function for, 9: 2016
Oxygen isotopes O^{17}
deuteron reactions (d,α), Q values and α spectra of, 9: 1361(J)
deuteron reactions (d,p), magnetic analysis of, 9: 1088(J)
energy levels, 9: 1393(J)
neutron reaction (n,p) cross section, 9: 7957
nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)
Oxygen isotopes O^{18}
abundance in fresh water, 9: 1952(J)
concentration in water of crystallization, temperature effects, 9: 2267(J)
deuteron reactions (d,p), differential cross sections for, 9: 4573(J)
deuteron reactions (d,p), proton groups and Q values of, 9: 1087(J)
gamma reactions (γ,p), N^{17} yield curve from, 9: 3644
isotope effect in oxidation of copper, 9: 850
Oxygen isotopes O^{19}
beta decay, F^{19} assignments from, 9: 363(J)
shell theory for, and other A = 19, 9: 4267(J)
spin and parity of 1.469-Mev level, 9: 4573(J)
Oxygen–manganese–nickel systems
phase diagrams, 9: 6261(R)
Oxygen–manganese–tantalum systems
metallic ternary phases in, 9: 3185(J)
Oxygen–nickel–titanium systems
phase studies, 9: 1874
Oxygen–niobium–tantalum systems
phase studies, 9: 6260
Oxygen–nitrogen systems
electric breakdown processes in, 9: 2377(J)
Oxygen–phosphorus–titanium systems
metallic phases in, 9: 858(J)
Oxygen–phosphorus–zirconium systems
metallic phases in, 9: 858(J)
Oxygen poisoning
effects of fasting and x irradiation on, in rats, 9: 5579(J)
Oxygen–tantalum systems
chemical properties, hardness, phase studies, and preparation, 9: 6260
Oxygen–thorium systems
chemical properties, hardness, phase studies, and preparation, 9: 6260
Oxygen–titanium systems
chemical properties, hardness, phase studies, and preparation, 9: 6260
constitution diagrams, 9: 2339(J)
creep deformation of, 9: 175(R)
creep-rupture tests in He atmosphere, 9: 5341(R)
evaporation rate of, 9: 2209(J)
fabrication, heat treatment, and effect of microstructure on mechanical properties of, 9: 178
isotopic equilibration determination of O in, 9: 3394
preparation, double inert-gas arc melting, forging, and welding, 9: 3489(R)
preparation of homogeneous, 9: 4809
size of interstitial solute atoms, lattice expansion, and electronic properties of close-packed, 9: 1780(J)
tensile properties in the temperature range -196 to 515°C, 9: 5667
vapor-solid equilibria in, 9: 2772(J)
Oxygen–uranium systems
constitution diagrams of showing composition vs total pressure at 900°K, 9: 7981
Oxygen–water systems
isotopic exchange reactions (thermal), 9: 6868
Oxygen–zirconium systems
chemical properties, hardness, phase studies, and preparation, 9: 6260
isotopic equilibration determination of O in, 9: 3394
size of interstitial solute atoms, lattice expansion and electronic properties of close-packed, 9: 1780(J)
Ozone
formation, effects of γ radiation on, 9: 7720(J)
heat and free energy of formation, 9: 529(J)

P

Package power reactors
design and cost factors, 9: 4566(J)
Packed columns
effect of pulsation on, 9: 5300(J)
heat transfer in cross-flow, equations for penetration of heat or solutes, 9: 140(J)
pulsed, calculation of pulse amplitude, 9: 3790
Pahasapa Limestone (S. Dak.)
geology of, 9: 165(J)
Painted Desert Area (Ariz.)
airborne radioactivity survey of, geophysical investigations map, 9: 2268(J)
Pair production
accompanying β transitions of nuclei, theory, 9: 4205(R)
from capture of slow μ^- or π^- mesons in H, 9: 5459(J)
in electron field at very low and very high energies, 9: 1937(J)
for electrons and photons, modifications to Bethe-Heitler formula for, 9: 6812(J)
nuclear charge effects on internally produced pairs, 9: 1076(J)
from radiative π meson capture and π^0 meson decay, theory, 9: 5460(J)
review on, in Annual Review of Nuclear Science, 9: 4007(J)
Paleotemperatures
concentration of O^{18} in water of crystallization, application to, 9: 2267(J)
isotopic measurement, 9: 4785(J)
measurement, O exchange between $CaCO_3$ and H_2O in, 9: 5000(J)
Palladium
adsorption of O_2 and CO on evaporated films of, 9: 2159(J)

Palladium (cont'd)
coulomb excitation, 9: 1066(R)
determination of, as sulfide, 9: 82(J)
energy levels study by means of electric excitation by protons, 9: 5476(J)
gamma ray yields from Coulomb excitation, 9: 6052(J)
permeability of, at 300°C, for purification of H_2, 9: 7841(J)
permeability to H_2, 9: 969, 7839
radiochemical determination, 9: 876
separation from Pt, Rh, and Ir, by ion exchange, 9: 7988(P)
Palladium(II) complexes
magnetic studies of, with vic-dioximes, 9: 2155(J)
Palladium–copper alloys
constitution diagrams, crystal structure, heat treatment, physical properties, and preparation, 9: 3174
Palladium fluorides
crystal structure, 9: 6912(J)
Palladium isotopes
electric excitation energy levels and pulse height spectra, 9: 4205(R)
excited states of, by Coulomb excitation, properties of, 9: 5483(J)
separation of Ag^{111} from neu[illegible]barded, by isotopic exchange, 9: 7441
Szilard-Chalmers concentration, 9: 1959(J)
Palladium isotopes Pd^{98}
half life determination of, 9: 7061(J)
Palladium isotopes Pd^{99}
half life determination of, 9: 7061(J)
Palladium isotopes Pd^{102}
decay scheme, 9: 1408(J)
disintegration, 9: 2970(J), 6110(J)
Palladium isotopes Pd^{104}
gamma rays from Coulomb excitation, angular distribution of, 9: 6053(J)
lifetime of first excited state, upper limit of, 9: 1072(J)
Palladium isotopes Pd^{108}
gamma rays from Coulomb excitation, angular distribution of, 9: 6053(J)
Palladium isotopes Pd^{110}
gamma rays from Coulomb excitation, angular distribution of, 9: 6053(J)
Palladium isotopes Pd^{112}
beta and gamma decay, 9: 4018(J)
Palladium–molybdenum couples
development of, for high-temperature measurements, 9: 185
Palladium–uranium alloys
crystal structure of UPd_3, 9: 6944(J)
Pantothenic acid
effects on fatty acid metabolism in liver, in rats, tracer study, 9: 5304
Papago Mining District (Ariz.)
geology of Black Dyke Prospect in, 9: 5324
Paper
(See also Filter papers.)
basis-weight determinations for, performance of a comparator for, 9: 307(J)
Paper chromatography
(See Chromatography.)
Parabiosis
effects of, on blood picture of x irradiated rats, 9: 4351(J)
Paradox Quadrangle (Colo.)
mineral investigations field studies map of, 9: 4151(J)
Paraffin
coating concrete surfaces with, for easy decontamination, 9: 6334
cosmic shower production in, 9: 2814(J)
neutron velocity and spectrum, 9: 7892(J)
penetrating showers produced in, 9: 5688(J)
slowing down of polarized protons by, 9: 2039(J)
Paramagnetic materials
energy distribution of neutrons scattered by, 9: 6750(J)
neutron scattering by MnO and MnF_2, 9: 6751(R)
Overhauser effect in, 9: 5772(J)
Paramecium
effects of x radiation on, 9: 3014(J)
growth, 9: 2547(R)
radiation injuries of, effects of oxygen tension and hydrogen peroxide production, 9: 4672(J)
Particle collectors
(See also Cascade impactors; Electrostatic precipitators; Filters.)
conifuge, design and performance, 9: 4041
design of, for radioactive dusts, 9: 1802
performance, 9: 3720(R)
for sampling dusts, evaluation, 9: 935
for sampling of radioactive dusts, design, 9: 1798(R), 1799(R), 1800(R), 1801(R)
Particle microscopes
(Non-optical microscope using ions other than electrons; see also Electron microscopes.)
design of Li ion, 9: 1950(J)
Particle tracks
(See also Photographic film; Photographic film detectors.)
analysis and counting of, 9: 1056(J)
apparatus for gap length measurement in nuclear emulsions, 9: 1010
average gap length between exposed grains, measurement, 9: 2414
in cloud chambers, method for estimating disortion of, 9: 2421(J)
correction of length, for grain density and background, 9: 1982(J)
discrimination of α-p and α-t, in C-2 emulsions, 9: 2852
gap-length measurements in nuclear emulsions, design of apparatus, 9: 4513
measurement in distorted nuclear emulsions, 9: 2851
measurement in nuclear emulsions by mean gap lengths, 9: 699
microinterferometric examination of, in nuclear emulsions, 9: 2439(J)
multiple scattering determination from, 9: 4895(J)
in nuclear emulsions, characteristics, 9: 5436(J)
thickness of, of heavy nuclei, 9: 3598(J)
tracing in thick nuclear emulsions, procedures and equipment to improve, 9: 310(J)
Particle trajectories
analysis of, in linear accelerators, 9: 3988
graphical analysis, 9: 4478
Particles
(See also headings such as Nickel powders; see also Aerosols; Charged particles; Cosmic particles; Dusts; Elementary particles; Nuclear particles; Powders.)
counting, design of a photometer for, 9: 4215
determination of specific surface of sieve-size powders, methods, 9: 2622(J)
electric properties, effect on aggregation, 9: 3904(R)
energy losses of, in matter, 9: 7950(J)

Particles (cont'd)
heavy, range straggling in matter, stochastic methods applied to, 9: 6137(J)
interaction of system of, with electromagnetic fields, 9: 6809(J)
of limestone, quartz, and Pyrex glass, effects of intraperitoneally injected, on survival of irradiated mice, 9: 7640(J)
[illegible]metric size measurement, 9: 4939
pulmonary absorption of, in rats and dogs, 9: 3360
of Pyrex glass, effects of injected, on susceptibility of irradiated mice to bacterial infection, 9: 7625(J)
screening of, in centrifugal elutricator, 9: 623(R)
size and counting measurement techniques, 9: 253(J)
size determination, 9: 4778
size measurement, equipment, 9: 3720(R)
size measurement of, in fission product aerosols, 9: 819
size measurement of, performance of conifuge for, 9: 4041
surface area determination by adsorption of N_2 at low temperatures by, 9: 56(R)
surface area measurements of, by turbidimetric methods, 9: 623(R)
unstable, competition between decay and capture of, 9: 7972(J)
size measurement, in very fine powders, 9: 1291(J)

Peanuts
radioinduced mutants in, 9: 7628(J)

Pegmatite deposits (Colo.)
mineralogy, 9: 4156(J)
occurrence in Crystal Mountain District and mineralogy of, 9: 3157(J)

Peninsular ChemResearch, Inc., Gainesville, Fla.
progress reports on the use of heterocyclic compounds as lubricant additives, 9: 5926(R)

Penn Haven Junction (Penna.)
exploration, geology, and U distribution, 9: 164(J)

Pennsylvania (Carbon Co.)
exploration, geology, and U distribution, 9: 164(J)

Pennsylvania State Coll., State College. Mineral Industries Experiment Station
progress reports on investigation of mineralogy, petrography, and paleobotany of U-bearing shales and lignites, 9: 621(R), 622(R), 1511(R), 1826(R), 1827(R), 3461(R), 3462(R)

Pennsylvania State Coll., State College. School of Mineral Industries
progress reports on refractory materials for high-temperature areas of aircraft, 9: 3844(R)

Pennsylvania State Univ., State College. Petroleum Refining Lab.
progress reports on fluids, lubricants, fuels, and related materials, 9: 136(R), 2795(R), 3123(R), 4484(R)

Pennsylvania State Univ., University Park
progress reports on thermodynamic properties of B and Al compounds, 9: 6866(R)

Pennsylvania State Univ., University Park. Coll. of Chemistry and Physics
progress reports on coordination polymers, 9: 6218(R)

Pennsylvania State Univ., University Park. Mineral Industries Experiment Station
progress reports, 9: 5905(R)
progress reports on fluids, lubricants, fuels, and related materials, 9: 5934(R), 6949(R)
progress reports on mechanism of graphitization and gas reactions of graphites, 9: 5904(R)

Pentaerythritol tetranitrate
detonation velocities of, 9: 3214

Pentane, dodecafluoro-
solubility in $Si(CH_3)_4$, 9: 6209(R)

2,4-Pentanedione
chelates with Be, Cd, Ce, Co, Cu, Mg, Mn, Ni, UO_2^{2+}, and Zn, formation constants, enthalpy, and entropy, 9: 3390(J)
ions, equilibrium, formation constants of Mg^{++}, Cd^{++}, Mn^{++}, Fe^{++}, Co^{++}, UO_2^{++} and Cu^{++} with, in aqueous solution, 9: 1752(J)

2,4- Pentanedione complexes
of Al, infrared spectra, 9: 6873(R)

2,4-Pentanedione ions
thermodynamic formation constants in aqueous solution for reactions of Zr^{++}, Ni^{++}, Ce^{+3}, Pr^{+3} with, at 30°C, 9: 1191(J)

2-Pentanone, 4-methyl-
distillation and spectrophotometric determination of, in aqueous U solutions, 9: 533

3-Penten-2-one, 4-methyl-
(See Mesityl oxide.)

Peptides
acetylation of, by ethyl thioltrifluoroacetate in aqueous solution, 9: 123
radiolysis of, 9: 7232(R)

Perchlorate ions
conductometric determination in alkali metals by paper chromatography, design and performance of apparatus for, 9: 2215(J)

Perchloric acid
atomic hydrogen hyperfine structure in, 9: 1687(J)
Ce^{4+} in, preparation and standardization, 9: 5810(J)
hood scrubber unit for, design, 9: 932
neutralization titrations of, in anhydrous pyridine, 9: 862(J)
potentiometric titration of, in formic acid with an H electrode, 9: 523(J)

Perfluoroörganic compounds
(With specific organic compounds, the standard numerical prefixes or the general term Fluoro- are used instead of the term Perfluoro-.)
chemistry, 9: 5282
dielectric constants, 9: 6213(J)
solvent properties of, for I_2, SnI_4, and phenanthrene, 9: 95(J)
synthesis by fluorination of dimethyl-substituted fluoranthene and physical properties, 9: 2650

Periscopes
stereoscopic, design of, for remote viewing, 9: 566(J)

Periston
(See Pyrrolidone, vinyl- polymers.)

Permeability
(See also appropriate subheadings under specific materials; see also Diffusion; Magnetism; Porosity.)
porous glass barriers, to CO_2, 9: 7022

Perovskites
crystal structure of $KNbO_3$ and nuclear resonance of Nb^{93}, 9: 1351(J)
neutron diffraction and magnetic properties, 9: 1067(R)
structures of compounds and solid solutions of structures closely related to, 9: 6350(J)

Peroxides
inorganic, preparation and properties, 9: 521
role of, in formation of lesions by radiation, 9: 5842(J)

Pertechnetates
corrosion inhibition by, 9: 1825

Perturbation theory
adiabatic form, use in problem of particle interaction with quantum fields, 9: 4906(J)
explicit expansions in, 9: 6549(J)
in neutronics, 9: 5829(J)

Pervanadyl ions
absorption spectra and chemical and thermodynamic properties, 9: 60

Peters Creek Area (Alaska)
exploration for radioactive deposits, geology, mineralogy, 9: 5650(J)

PETN
(See Pentaerythritol tetranitrate.)

Petroleum
boundary lubrication of steel with, 9: 4979
in cased wells, differentiation of oil-bearing and water-bearing beds by radioactive methods, 9: 7779(J)
geophysical prospecting by radiometry, 9: 7778(J), 7781(J)
location of, by use of radioactive Na, 9: 7780(J)
water contacts in drive-pipe well, determination of, 9: 7780(J)

Petroleum Refining Lab., Penna. State Univ. Coll. of Chemistry and Physics
(See Pennsylvania State Univ., State College. Petroleum Refining Lab.)

Phantoms
gelatin, application in radiation dosage determinations, 9: 6730(J)
mouse, rat, and rabbit radiation depth-dosage determinations, 9: 2547(R) 2547(R)
preparation of, for radiation treatment planning, 9: 1727(J)

Pharmaceuticals
(See also Drugs.)
sterilization by high-energy electrons, 9: 2053(J)

Phase studies
(See also appropriate subheadings under specific alloys and systems; see also Diffusion; Grain Growth; Solutions.)
analysis of continuity of one phase in a powder mixture of two phases, 9: 2243(J)
application of scintillation counter to vapor phase analysis, 9: 2873(J)
cubic to orthorhombic diffusionless phase changes, experimental and theoretical studies, 9: 3885(J)
design and performance of a tungsten-coil furnace for high-temperature x-ray diffraction investigations of phase changes and equilibria, 9: 2319(J)
double scanning sample holder for, of annealed sheets, 9: 6993
effect of degree of dispersion and density of phases on equilibrium, 9: 63
of metals and alloys, method, 9: 4453
theory for liquid–crystal and liquid–gas transition, 9: 7403(J)
theory of diffusionless phase transformations, 9: 1861(R)
time lag in self-nucleation, 9: 4721(J)

Phenanthrene
solubility of, in a perfluoroamine and perfluoroether, 9: 95(J)

1,10-Phenanthroline
analytical uses for determination of Fe in presence of U, 9: 4074
analytical uses of, for determination of Fe in Al alloys, 9: 5600(J)

1,10-Phenanthroline, iron(II) salts
(See Ferroin.)

Phenanthroline complexes
effects of γ radiation, 9: 3267(J)

Phenols
adsorption of, by polyvalent forms of anion-exchange resins, 9: 2212(J)
metabolism of, effects of irradiation on, in rats, 9: 2548(R), 4665

Phenothiazine
effects of, on uptake of I^{131} by thyroid gland in rats, 9: 508(J)
labeled with sulfur^{35}, preparation, 9: 4115(R)
toxicity of, for horses, 9: 1156(R)

Phenothiazine, 3-chloro-10-(3'-dimethylaminopropyl)-
x-ray protection of guinea pigs injected with, 9: 43(J)

Phenyl borates
preparation and chemical properties, 9: 4712(J)

Phosgene
fundamental vibrations of, 9: 917(J)

Phosphate deposits (U.S.)
occurrence of U bearing, 9: 5326(R)

Phosphate glass
containing Co, as a high-level γ radiation dosimeter, 9: 1040
silver-activated, in measurement of high doses of γ radiation, 9: 3932
silver-activated, mapping gamma ray fields with, 9: 3261(J)

Phosphate ions
electrical mobility of, in paper electrochromatography, 9: 1222(J)

Phosphate slimes
particle size distribution, filtration, and preparation, 9: 6876(R)

Phosphates
(See also specific phosphates.)
effects of dietary, on bone deposition of Sr^{90}, 9: 846
effects of neutrons on, 9: 4911(R)
effects on metabolism, 9: 3(R)
hydrolysis velocity of pyrophosphate, tripolyphosphate, and hexametaphosphate, 9: 2618
isotopic exchange between tricalcium phosphates and solutions of, tracer study, 9: 90(J)
metabolism by algae, tracer study, 9: 3(R)
metabolism of, in erythrocytes in dogs, tracer study, 9: 2547(R)
ortho, coulometric determination, 9: 2177(J)
recovery, effects of acid strength, calcination, and digestion time on, 9: 7271
recovery from Florida leached zone material, cost factors, 9: 6877
recovery from H_2SO_4 digestion solutions, 9: 6184
synthesis of P^{32} and S^{35} labeled diethyl-4-nitrophenylthiophosphate and ethyl-4,4'-dinitrophenylthiophosphates, 9: 2681(J)

Phosphatides
synthesis, effects of whole-body x irradiation on, in rats, 9: 1161(J)

Phosphenes
mechanism of x-ray, in eye of frog, 9: 5214(J)

Phosphides
of Ce, Pr, and La, preparation and crystal structure, 9: 5619(J)

Phosphine oxide, tris(trifluoromethyl)-
preparation, 9: 3418(J)

Phosphines
polymerization of bisperfluoromethylchloro-, 9: 6235

Phosphinic acid, bis(trifluoromethyl)-
preparation of, by hydrolysis of $(CF_3)_2PCl_2$ or $(CF_3)PCl_3$, 9: 3417(J)

Phosphites
oxidation of, by α rays, 9: 582(J)

Phospholipids
(See Phosphatides.)

Phosphorescence
(See also Fluorescence; Luminescence; Phosphors.)
design and performance of apparatus for detection and measurement of, in inorganic and organic compounds, 9: 3759(R)
method of recording decay of, 9: 4485(J)
of organic molecules at low temperatures, sensitized, 9: 7495(J)

Phosphoria Formation (Mont.)
physical stratigraphy of, 9: 5048(J)

Phosphoric acid
corrosive effects on Ti, electron diffraction analysis of, 9: 5970(J)
solubility of U(IV) orthophosphate in, at 25°C, 9: 129

Phosphoric acid, esters
as high-temperature lubricants, preparation and properties, 9: 4420
synthesis, thermal decomposition, and properties of, used as high-temperature lubricants, 9: 517(R)

Phosphoric acid, ribulose esters
carboxylation of, during photosynthesis, 9: 5586
preparation, 9: 4705(R)

Phosphoric acid–uranium(IV) oxide systems
phase studies, 9: 129

Phosphors
(See also specific phosphorescent materials; see also Luminescence; Phosphorescence; Scintillation detectors.)
alkali halide, photostimulated emission of activated, 9: 2424(J)
alpha-induced scintillation in terphenylxylene, mechanism, 9: 4519(J)
bismuth-activated, CaO(Bi) and SrO(Bi), absorption and emission spectra of, 9: 6545(J)
decay of Ag-activated ZnS, after excitation by α particles and electrons, 9: 4405(J)
decay times, pulsed photomultipliers for measurement of, 9: 6092
decay times of organic, 9: 2426(J)
dielectric imbedded, voltage dependence of electroluminescent brightness, 9: 5728
dry boxes for handling, design, 9: 4401(J)
effects of β irradiation on, at 25 and -70°C, 9: 5917(J)
effects of infrared radiation on doubly activated ZnS, 9: 431(J)
electroluminescence of organic, by alternating electric fields, 9: 1974(J)
electroluminescent, increasing light output with strong electric fields, 9: 4538(J)
electron trap distributions in, 9: 252(J)
emission, duration, and quenching of light in, 9: 7494(R)
emission from ZnS and ZnS:CdS, influence of alternating electric fields on, 9: 7075(J)
energy transfer in irradiated solutions of mixed, 9: 3759(R)
excitation, magnetic susceptibility due to, 9: 7072(J)
fluorescence in, under high-energy irradiation, 9: 2876(J)
fluorescent respone of NaI(Tl) to nuclear radiations, 9: 1043(J)
infrared stimulated, use in dosimetry of ionizing radiations, 9: 7863(J)
large NaI crystal combined with TV device for continuous display of pictures produced by 50-Mev x rays, 9: 6255(J)
large volume plastic, preparation, 9: 4528(J)
luminescence of alkali halides, activated by heavy metals, 9: 1784
luminescence of KBr–Ni and KBr–Cu excited by x-rays, 9: 3230(J)
luminescent efficiencies, 9: 232(R)
microheterogeneous structure of Ag-activated KCl and NaCl, 9: 2368(J)
mounting techniques for NaI(Tl), 9: 4856(J)
neutron detection by standard and activated LiI crystals, 9: 3947(J)
organic, recombination luminescence in, 9: 864(J)
orientation of Eu ions in CaF_2, 9: 1934(J)
particle size distribution, measurement of, 9: 2344(J)
performance of, as neutron detectors, 9: 1601
performance of boric oxide glass, for slow neutron detection, 9: 1036
phosphorescence of inorganic, organic, and mixed, 9: 3759(R)
photoluminescence yield in KI(Tl), dependence on Tl concentration, 9: 1758(J)
photoluminescent modulation in nonuniformly excited ZnS, 9: 7887(J)
plastic, polymerization of, 9: 1320(J)

Phosphors (cont'd)
potting of NaI and LiI, 9: 3936
preparation and properties of, for use with γ spectrometers, 9: 1507
preparation of certain organic compounds for use as solvents for, 9: 3773(J)
preparation of thin plastic, 9: 7455
proton synchrotron beam size determination with potassium iodide probe, 9: 7871(J)
response of, effect of temperature on, 9: 7456
response of NaI(Tl), KI(Tl), and stilbene to fission fragments, 9: 1606(J)
scintillation, properties and performance of, in neutron detection, 9: 3931(R)
scintillation response of, at low energies, 9: 707(J)
scintillation solvents, preparation and properties of toluene-n-propyl alcohol-water, 9: 4705(R)
strontium sulfide (activated), paramagnetic resonance spectrum and quantum efficiency, 9: 4487(J)
symposium on solid inorganic, 9: 1614(J)
use in luminescence chambers, 9: 2860(J), 4248(J)
well-type scintillation crystals, effectiveness in bremsstrahlung counting P^{32}, 9: 1981(J)
x-ray-diffraction studies of Ag-activated halide, 9: 1933(J)
zinc sulfide, mechanism of fluorescence, 9: 6003(J)
ZnS:Mn films, electroluminescent brightness as a function of voltage, 9: 5729(J)

Phosphors (liquid)
argon treatment to remove dissolved O_2 and increase performance, 9: 1600
change of naphthalene-xylene fluorescence with age, 9: 4518(J)
effects of solvents on pulse heights of, 9: 1976(J)
fluorescence efficiency of, 9: 3952(J)

Phosphorus
colorimetric determination of, in U and U oxides, 9: 7696
determination of μg quantities of, in waters containing As, Si, and Ge by Mo blue reactions, 9: 2638(J)
deuteron reactions (d,n), energy spectrum and angular distribution of neutrons from, 9: 6776(J)
effects of dietary, on metabolism of Ca and P in rats, tracer study, 9: 1156(R)
electroluminescence, 9: 2343(J)
foliar absorption and metabolism of, in strawberries, tracer study, 9: 3751
incorporation into desoxyribonucleic acid in mice, effects of irradiation on, tracer study, 9: 5848(J)
incorporation into nucleic acid, effects of whole-body x irradiation on, tracer study, 9: 3730(R)
mass spectrographic analysis, 9: 1032(J)
metabolism of, in rats, tracer study, 9: 1156(R)
neutron activation determination of, in Al and Al_2O_3, 9: 5891(J)
photonuclear reactions, 9: 2449(J)
radiochemical determination, 9: 876
role of, in plant photosynthesis and respiration, 9: 3048
spectrophotometric determination of, as molybdovanadophosphoric acid, 9: 2635
tissue distribution of, in embryos and pregnant females, tracer study, in rats, 9: 19
tissue distribution of, in lymph nodes and tumors, tracer study, 9: 18
tissue distribution of, in mice, tracer study, 9: 5219(J)
uptake in bean plants, effects of environmental factors on tracer study, 9: 3753
vaporization, 9: 2823(J)

Phosphorus acids

isotopic exchange of H atoms in, 9: 7713(J)

Phosphorus(V) chlorides

complexes with zirconium tetrachloride, $ZrCl_4$ recovery from, 9: 1425(P)

isotopic exchange reactions of, in CCl_4, 9: 4373(J)

Phosphorus compounds

(See also Chemical warfare agents.)

organic, preparation and properties of, 9: 1792

Phosphorus fluorides

electrical conductivity, 9: 3415(J)

Phosphorus ions

transfer through mucosa of normal and artificially constructed bladders, tracer study, 9: 1732(J)

Phosphorus isotopes P^{28}

decay scheme, 9: 2997(J)

half life and activities, 9: 5533(J)

Phosphorus isotopes P^{29}

beta spectrum, 9: 5755(R)

decay schemes, 9: 2057(J)

Phosphorus isotopes P^{30}

beta emission, 9: 1121

gamma emission, 9: 7893(R)

mass determination and β^+ energy of, 9: 6485(J)

Phosphorus isotopes P^{31}

gamma reactions (γ,n), 9: 6485(J)

neutron reactions (n,γ) activation curve of and threshold of, 9: 6082(J)

nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)

proton reactions (p,γ), first excited states of P^{31} from, 9: 7544(J)

Phosphorus isotopes P^{32}

assay of liquid samples containing, by bremsstrahlung counting with a well-type scintillation crystal, 9: 1981(J)

beta decay and K capture, autoionization effects due to, 9: 6465(J)

beta emission, internal and external bremsstrahlung accompanying, 9: 2505(J)

beta spectrum, 9: 1994(R)

chloroplasts in biochemical functions of plant cells studied by, 9: 7656(J)

colloids of, preparation and tissue distribution in animals, 9: 1459(J)

concentration in skin tumors, 9: 6834(J)

differential uptake of, in diagnosis of intraocular neoplasms, 9: 49(J)

dispersion of saline solutions in soil studied by, 9: 6644(J)

effects of pre-treatment with, on growth of transplanted tumors in rats, 9: 6578(J)

entrainment of, on Cu sulfide, 9: 862(J)

excretion of PO_4 ion studied by, 9: 6593(J)

first excited states of, from (p,γ) reactions in P^{31}, 9: 7544(J)

gamma emission of, 9: 807(J)

histamine effect on nerve tissue studied by, 9: 7663(J)

inactivation of bacteriophage by ingested, 9: 3367(J)

K x rays following autoionization, measurement of, 9: 6534(J)

morphological effects of injected, on cells in mice, 9: 5219(J)

oxidation states of, effect of irradiation conditions on, 9: 7724(J)

plant fertilization studied by, 9: 7659(J)

positron emission from, 9: 5185(J)

range in NaCl of, produced by $Cl^{35}(n,\alpha)P^{32}$ reaction, 9: 7943(J)

range of, from reaction $S^{32}(n,p)P^{32}$, 9: 6083(J)

separation of, by diffusion, 9: 4235

Phosphorus isotopes P^{32} (cont'd)

tissue distribution in anesthetized and stimulated rabbit, 9: 2544(J)

treatment of erythremia and leucosis with, 9: 7645(J)

treatment of skin diseases with, 9: 7646(J)

Phosphorus isotopes P^{34}

gamma spectra and decay scheme, 9: 7893(R)

Phosphorus oxides

heat and free energy of formation, 9: 529(J)

Phosphorus–oxygen–titanium systems

metallic phases in, 9: 858(J)

Phosphorus–oxygen–zirconium systems

metallic phases in, 9: 858(J)

Photochemistry

(See also appropriate subheadings under specific materials and radiations; see also Photosynthesis.)

of aqueous solutions, equipment, 9: 6868

identification of solvated electrons and radicals in rigid solutions of photooxidized organic molecules, 9: 864(J)

symmetrical semiquinone formation by reversible photooxidation and photoreduction, 9: 865(J)

theory of photo-electromotive forces developed at metal-semiconductor junctions, 9: 3761

Photoelectric cells

(See also Crystal detectors; Photomultiplier tubes.)

design for spectrographs and interferometers, 9: 6130(J)

performance, 9: 3208(R)

properties and applications to electron multipliers, 9: 1617(J)

Photoelectric effect

theory of, 9: 655

Photofission

of uranium U^{238}, yields from, and symmetric and asymmetric cross sections up to 300 Mev, 9: 6142(J)

Photographic emulsions

(See also Nuclear emulsions.)

calibration by a rotating step-sector method, 9: 4970

detection of radiation from actinium by, 9: 6524(J)

measurement of Schwarzschild's constant for, 9: 7067

methodological study of, used in nuclear physics, 9: 4532(J)

neutron–proton reactions in, 9: 6034(J)

resolving power and true exposure distribution, 9: 308(J)

response to β radiation, quantitative relationship, 9: 7074(J)

scattering of 6.6-, 11.5-, and 18.0-Mev electrons by, 9: 2942(J)

sensitivity and photographic action by x radiation, 9: 7828(J)

Photographic film

detection of water aerosols by, 9: 7408

development, blackening phenomena, 9: 7399(J)

effect of continuous exposure of different durations on properties of, 9: 5083(J)

effects of γ radiation on, 9: 5529

measuring apparatus for, using a reference line of variable brightness, 9: 2396(J)

Photographic film detectors

commercial services, survey, 9: 2875(J)

design and calibration of body film badge, 9: 6724

dosimeter for use in atomic disaster, 9: 6412(J)

effect of body backscatter on, 9: 3953(J)

performance of, in detecting x and γ radiation over a wide band of energies, 9: 1318

Photographic film detectors (cont'd)
from photographic roll film from local drugstores for dosimetry following atomic disaster, 9: 698
radioactive measurements with, 9: 2432(J)
self-processing and self-reading, for rapid determination of γ dose, 9: 1965
storage, use, calibration, processing, and interpretation of results of, for dosimetry of x and γ radiation, 9: 2428(J)

Photography
(See also Cameras.)
bibliography of techniques and equipment, 9: 233

Photomesons
cross sections for, and energy distributions of, 9: 7944(R)

Photometers
(See also Fluorophotometers.)
calibration, 9: 4939
design for counting aerosol particles, 9: 4215
logarithmic recording, design, 9: 7432
performance of, for aerosol detection, 9: 3775(R)

Photometry
measurement of cloud chamber ionization by, 9: 6727(J)
photographic, investigation of impact broading of mercury resonance line by, 9: 6544(J)

Photomicrography
apparatus for observing and recording microstructures of metals, 9: 4464(J)
of tin–uranium alloy specimens, preparation of, 9: 7373(J)

Photomultiplier tubes
analysis of dynode operation, 9: 2866(J)
analysis of last stage in, 9: 4855(J)
application of photoelectric cells to, 9: 1617(J)
breakdown at high voltages, prevention of, 9: 1026(J)
cosmic ray background effects, 9: 305
dark-current fluctuation in, 9: 7463(J)
design, 9: 6372(R)
design and performance of a high-current, for use as radiation detector 9: 1039
design and testing, 9: 1893(R), 7427(R)
design for scintillation counting, 9: 4854(J)
development of high-current and high-speed, 9: 3251(R)
effects of gamma radiation on gain of, 9: 1322(J)
effects on relative pulse heights of liquid scintillation detectors, 9: 7447
efficiency for α particle detection, 9: 3600(J)
performance of, 9: 301
performance of, in neutron detectors, 9: 3931(R)
performance of, in scintillation counters for fast neutrons, 9: 1036
pulse-height distribution and dark current, 9: 5128(J)
pulsed, for measurement of decay times of phosphors, 9: 6092
response of, effect of temperature on, 9: 7456
for scintillation counting, design and performance, 9: 1580(R)

Photon showers
angular distribution of electrons in electron-, 9: 7425(J)
shower equations applied to, 9: 7587(J)

Photoneutrons
measurement of yields with NaI crystal, 9: 3944(J)
yield and angular distribution from Li, Be, C, Al, Fe, Cu, and Pb exposed to 250 Mev γ rays, 9: 6772(J)

Photons
(See also Cosmic photons; Gamma radiation; X radiation.)
absorption, nucleon displacement determined from harmonic mean energy for, 9: 1079(J)
absorption cross sections, calculations of, 9: 7528(J)
bipartition angles of scattered, from Compton scattering, 9: 6698(J)
Compton scattering of circularly polarized, by an electron with given spin directions, 9: 2035(J)
in decay products of K-mesons, confirmation of, 9: 6021(J)
emission according to the Bloch-Nordsieck approximation, 9: 6519(J)
ionization of low-pressure gases due to absorption of, 9: 5810(J)
meson (π^-) production by 0 to 250 Mev, on D, 9: 6012(J)
multiple production in bremsstrahlung at high energies, cross section for, 9: 7176(J)
multiple production in high-energy processes, quantum electrodynamical treatment of, 9: 5547(J)
nuclear photoeffect from high-energy, calculations, 9: 5150
nuclear reaction Ni(γ,p) of 21.5 to 28.0 Mev, energy and angular distribution, 9: 5779(J)
nuclear reactions, formulas for angular distribution, 9: 4647(J)
pairs, emission of, in magnetic fields, 9: 414(J)
production of multiple, by electron positron annihilation, 9: 1343(J)
production of multiple, by elementary particles coupled to electromagnetic field, 9: 6132
radiation process $\pi^0 \rightarrow 2\gamma$, non-gauge term in, 9: 5827(J)
scatter of unpolarized, by Na, atomic alignment from, 9: 245(J)
scattering by nucleons, calculation of cross section from experimental photomeson production cross section, 9: 405(J)
scattering of, theory, 9: 2031
scintillation counting of low-energy, for use in x-ray diffraction, 9: 313(J)
self mass, theory, 9: 1143(J)

Photoperiodism
effects of, on Xanthium and Paramecium, 9: 4911(R)
effects on floral stimulus, 9: 3(R)
effect on Hill reaction, effects of thioctic acid on, 9: 5569

Photoprotons
emission mechanisms, 9: 7944(R)

Photosynthesis
(See also Photochemistry.)
carbon distribution in organic substances formed by, 9: 7658(J)
carboxylation of ribulose-1,5-diphosphate during, by cell-free extracts of Chlorella, 9: 5586
effects of thioctic acid on the Hill reaction in intermittent light, 9: 5569
function of carotenoids in, 9: 5835
intermediate products of, isolation and degradation, tracer study, 9: 48
mechanisms of energy transfer during, 9: 3048
primary products of, studied by C^{14}, 9: 7657(J)
production of carbohydrates during, tracer studies, 9: 4363
quantum energy requirements, 9: 3357
rate and carboxylation reaction, 9: 2136(R)
reaction mechanisms, 9: 4705(R)

Photosynthetic products
distribution of, in phloem of grape, tracer study, 9: 3(R)
isolation and degradation of, tracer study, 9: 48

Phthalic acid, diethyl ester
addition compounds with $ZrCl_4$ and $HfCl_4$, preparation and properties, 9: 72(J)

Phthalocyanines
metal complexes, Szilard-Chalmers reactions in, 9: 1959(J)

Physics
(See also Astrophysics; Geophysics; Health Physics; Mathematics; Nuclear Physics.)

Physics (cont'd)
modern physics for the engineer, book, 9: 3902(J)
progress in metal, 9: 2305(J)
symposium on present state of, 9: 2337(J)
2-Picoline, 5-ethyl-
chemical reactions, 9: 5884(J)
Picric acid
detonation velocities of, 9: 3214
Picric acid complexes
infrared spectra, and molecular properties, theory, 9: 6625
Piezoelectric crystals
gages for recording air blast pressure transients, 9: 6374
handbook of, for radiofrequency control, 9: 6689
Pinto-Chinle Area (Ariz.)
geophysical investigations map of, 9: 6658(J)
Pipe joints
(See also Gaskets.)
corrosion and welding in stainless steel boilers, 9: 6947
high-pressure low-resistance, design and efficiency, 9: 4212
high-temperature brazed, shear properties, 9: 5355
stress corrosion of, from a stainless steel mine-sweeper boilers, 9: 5947
Piperidine
neutralization titrations of, in anhydrous pyridine, 9: 882(J)
Pipes
(See also Tubes.)
bends, effects of internal pressure on flexibility of large-radius, 9: 4124
effects of blast from atomic explosions on standpipes, 9: 659
fluid flow in curved, 9: 6954(J)
graphitization of piping systems, evaluation, 9: 5374(J)
inner stress, compensation for errors in measurement in the drilling process to detect, 9: 5965(J)
laminar-turbulent transition phenomena in, 9: 3131(J)
non-Newtonian flow in, pressure losses, 9: 4769
radiography of welds in, 9: 4136(J)
welding of stainless steel, 9: 1279(J)
Pipettes
micro, remotely controlled, design, 9: 559(J)
Pitchblendes
(See also Uraninites.)
ages by x-ray-diffraction analysis, 9: 6555(J)
occurrence of, near Champagny, France, 9: 3160(J)
uranium recovery from nitric acid digestion residues of, 9: 601(J)
Pittsburgh, Univ.
progress report, 9: 4482(R)
progress reports on alloy formation, 9: 7351(R)
Pituitary gland
direct and explant-transplants of, effects on uptake of I^{131} by the thyroid gland of hypophysectomized rats, 9: 1733(J)
effects of irradiation of brain stem and hypothalamus on function of, in primates, 9: 832(J)
effects of irradiation of hypothalamus on function of, in primates, 9: 833(J)
effects of removal of, on survival of total-body x irradiated rats, 9: 5238(J)
influence of, on mast cell number in skin of rats, 9: 3(R)
localized radiotherapy of lesions of, technique, 9: 4925(J)
proton irradiation of, 9: 7642
Pituitary gland (cont'd)
radiosensitivity of, in toads, 9: 2550
tumors of, factors affecting, 9: 6835(J)
tumors of, in irradiated and non-irradiated mice, 9: 2558(J)
tumors of, mechanism of induction and characteristics, 9: 1450(J)
Pituitary hormones
effects of, on thyroid gland in toads, 9: 2550
effects of hypophysectomy on radioinduced histologic changes in thyroid gland of rats, 9: 2113(J)
effects of injected, on radiation injuries in mice, 9: 1721(J)
effects of thyrotropin on iodine metabolism by thyroid, tracer study, 9: 4690
effects of thyrotropin on thyroid uptake of I^{131} and serum concentration of protein-bound iodine, 9: 5578(J)
effects on recovery of hematopoietic tissue from radiation injuries, in rats, 9: 7641(J)
Placental tissues
metabolism of S^{35}-labeled albumin in, autoradiographic study, 9: 5208(J)
Placer deposits (Alaska)
occurrence in Cache Creek and Peters Creek Areas, 9: 5650(J)
Placer deposits (U.S.)
occurrence of U bearing, 9: 5326(R)
Placerville District (Colo.)
mineralogy, 9: 1829
Plant cells
effect of surface on uptake of electrolytes by yeast, tracer study, 9: 4692
quantitative β-track radioautography, 9: 1734(J)
Plant metabolism
biosynthesis of carbohydrates, tracer studies, 9: 4363
of calcium and Sr, effects of environmental factors, 9: 4056
effects of environmental factors on, tracer study, 9: 3753
effects of radiation on salt uptake in, 9: 26(J)
enzyme reactions, 9: 4705(R)
foliar absorption and metabolism of Ca and P by strawberries, tracer study, 9: 3751
of 3-hydroxypyruvic acid, 9: 2136(R)
of iodine, effects of pH, plant species, and I concentration, tracer study, 9: 6174
of pyruvic acids by algae, 9: 4929
Plant physiology
effects of photoperiodism on floral stimulus, 9: 3(R)
microsporogenesis in excised anthers of Trillium grown on sterile media, 9: 3718(J)
Plant respiration
quantum energy requirements, 9: 3357
relationship to photosynthesis, 9: 3048
Plants
(Limited to papers dealing with vegetation; see also specific plants.)
alpha radioactivity in, 9: 445(J)
beta radiation effects on growth, 9: 6830(J)
cellular lethality after Co^{60} γ radiation on Crepis Zacintha L. Babc., 9: 6159(J)
crop yields, effect of radioactive substances on, 9: 7619(J)
distribution of α emitting substances in, 9: 4995
effects of periodic x radiation on, 9: 27(J)
effects of radiation on, 9: 1550(R), 7618(J)
fertilization, P^{32} and S^{35} study of, 9: 7659(J)
fission product absorption in, 9: 5837
genetic effects of P^{32} β radiation, 9: 6165(J)

Plants (cont'd)

nitrogen nutrition and metabolism in, studied by N^{15}, 9: 7660(J)

photosynthesis, distribution of carbon in organic substances formed by, 9: 7658(J)

photosynthesis products of, studied by C^{14}, 9: 7657(J)

physiology of fruits of oil-, studied by C^{14}, 9: 7661(J)

radiation effects of P^{32} on germination and growth, fertilizer effects, 9: 6163(J)

radiation effects on growth, temperature and atmosphere influences, 9: 6164(J)

radioactivity of, at the Annie Laurie Prospect (Ariz.), 9: 5003(J)

radioinduced mutations in, 9: 4348(J)

role of chloroplasts in biochemical functions of, studied by C^{14} and P^{32}, 9: 7656(J)

somatic mutations produced by chronic exposure to γ radiation in carnations, 9: 4044

volumetric analysis of, for F by distillation from H_2SO_4 solution, 9: 5270(J)

Plasma

(Limited to information on electric plasma; see also Electric discharge.)

charges in, particle characteristics, 9: 5820(J)

diffusion phenomena of, across magnetic fields, 9: 4497(J)

electroacoustical waves in, 9: 1573(J)

electron current to probe in, theoretical expression for, 9: 7049(J)

high-frequency gas discharge, in H, analysis, 9: 4496(J)

line broadening in ionic, quantum theory, 9: 3224(J)

longitudinal oscillations, 9: 3909(J), 3910(J)

magnetization of classical electron gases, kinetics, 9: 5399(J)

mean temperature and velocity distributions and effects of magnetic field, 9: 4224(J)

nonmaxwellian theory of homogeneous and anisotropic, 9: 1016(J)

oscillations, relativistic, 9: 6695(J)

oscillations in constant electric field, dispersion equations for, 9: 6694(J)

oscillations in electron beams, 9: 7034(J)

passage of charged particles through, 9: 5696(J)

properties of slightly nonideal, 9: 1574(J)

resonance, effect on microwave transmission, 9: 4210(R)

self-focusing properties of streams of ion-electron mixtures, 9: 5695(J)

small-amplitude oscillations in two-component ionized gases, model for, 9: 5398

Stark fields from ions, 9: 5404

theory of electrical probes for investigating, 9: 4225(J)

Plasters

(See also Gypsum products.)

mechanical properties of, 9: 1820(R)

Plastic deformation

coefficient of diffusion in, determination of, 9: 7398(J)

growth of, in bar submitted to longitudinal impact, 9: 177

propagation of, in solids, 9: 7822

Plastic films

preparation and properties of thin polyvinylchloride-acetate copolymer for β spectrometry and 4π counting, 9: 1613(J)

preparation of, for use as radiation absorbers, 9: 7453

design of holder for, as thin windows in cloud chambers, 9: 1055(J)

Plastic flow

(see also appropriate subheadings under specific materials; see also Fluid flow.)

mechanism of, 9: 1237

Plasticity

of metals, new criterion for, 9: 1867(J)

Plastics

bonding to plastics and to clad Al and Al alloys, effects of temperature on, 9: 651

corrosion resistance and applications of construction, survey and directory of, 9: 137(J)

effects of β irradiation on phosphor-containing, at 25 and -70°C, 9: 5917(J)

effects of γ radiation on materials used in conjunction with 10-kc source, 9: 432(J)

effects of high-energy electron irradiation, 9: 2053(J)

effects of radiation on, 9: 7569(J)

effects of radiation on polymerization, 9: 1785(J)

effects of radiation on vinyl chloride–vinylidene chloride co-polymer methyl methacrylate, containing pH indicators, 9: 2847(R)

effects of radiation on vinylite, 9: 1554(R)

electrical properties, 9: 4971

fatigue and stress, 9: 4159

hot pressure and cold-pressureless mounting, 9: 149(J)

inorganic, preparation and properties, 9: 4107

low-cost scaler utilizing, 9: 565(J)

lucite, secondary electron from, for primary electrons of 20 kev to 1.3 Mev, 9: 5989(J)

mechanical properties of rigid, at low temperatures, 9: 3216

plexiglass, strength of windows of, at 20°K, 9: 6416(J)

preparation and evaluation of acid anhydride-cured epoxy resins as, 9: 6640(R)

properties and preparation of acid anhydride-cured polyglycidyl ether resins, 9: 6639(R)

radiation stability and Young's modulus, correlation, 9: 5382(R)

tensile and electrical properties, effects of β and γ radiation on, 9: 7722

transient heat flow in thermally irradiated, analysis, 9: 5314(J)

use in preparation of radiation detectors, absorbers, and standards, 9: 2387(J)

Plates

heat transfer and friction coefficients for air flowing through stacks of parallel, 9: 5633

natural convection heat transfer from flat, 9: 4770

parallel, velocity distribution of fluid between, 9: 5315(J)

plastic buckling of simply supported, subjected to nonhomogeneous stress distribution, 9: 4121

thermal stresses in, mathematical analysis, 9: 7740(J)

thermal stresses in rectangular strips, theory, 9: 5390(J)

Platinum

adsorption of O_2 and CO on evaporated films of, 9: 2159(J)

determination of, as sulfide, 9: 82(J)

electron absorption and transmission in, 9: 6367(J)

excitation functions, 9: 7128(J)

extension of Matthiessen's Rule to cold-worked, 9: 1536(J)

gamma ray yields from Coulomb excitation, 9: 6052(J)

intermetallic compound with Nb, preparation and structure, 9: 3878(J)

proton reactions and radiochemical study, 9: 4864

range-velocity relation for fission fragments, 9: 1365(J)

separation from Pd, Rh, and Ir, by ion exchange, 9: 7988(P)

spectrographic determination of, in ores and rocks, 9: 162

thermal conductivity in region 1300 to 1800°K, 9: 1564(J)

transition probabilities, dipole and quadrupole, 9: 7917(J)

wetting with sodium silicate glass, 9: 6646(R)

Platinum–cobalt alloys

thermodynamic properties, 9: 2294(R)

Platinum–copper alloys
thermodynamic properties, 9: 2294(R)
Platinum electrodes
polarography with, in fused salts, 9: 5264(J)
Platinum–iridium alloys
vacancies and energy of vacancy formation in, 9: 3525(J)
Platinum isotopes
Szilard-Chalmers concentration, 9: 1959(J)
Platinum isotopes Pt^{188}
decay chain, 9: 5534(J)
Platinum isotopes Pt^{192}
energy levels and γ spectra, 9: 4333
gamma-γ directional correlation in, spin assignments from, 9: 7508(J)
Platinum isotopes Pt^{194}
energy levels from Ir^{194} decay and spins of first two excited states, 9: 4329(J)
gamma rays from Coulomb excitation, angular distribution of, 9: 6053(J)
Platinum isotopes Pt^{195}
excited levels from Au^{195} decay, transition, 9: 387
fission cross sections for 380-Mev neutrons, 9: 5156(J), 5778(J)
Platinum isotopes Pt^{196}
gamma emission coefficients, 9: 7893(R)
gamma rays from Coulomb excitation, angular distribution of, 9: 6053(J)
Platinum isotopes Pt^{199}
decay schemes, 9: 988(R)
Platinum metal oxides
heat and free energy of formation, 9: 529(J)
Platinum–nickel alloys
relaxation effects in solid solutions of, arising from changes in local order, 9: 204(J)
Platinum–platinum–rhodium alloys couples
calibration of, against standard Pt resistance thermocouples, 9: 185
Platinum–ruthenium alloys
electric conductivity, 9: 976
Platinum–uranium alloys
crystal structure of UPt_3, 9: 6944(J)
Plutonium
absorption and x-ray spectrum, 9: 2081(J)
absorption of, from gastrointestional tract, comparison between rats and pigs, 9: 1703
binary diagrams of, with various metals, 9: 7796(J)
crystal structure and thermal expansion, 9: 6351(J)
electrodeposition, 9: 3803(J)
electron configuration, 9: 4977(J)
excretion, effects of Ca EDTA on, 9: 1739, 6172(J)
films, preparation of thin, 9: 3945(J)
fission cross section for thermal neutrons, 9: 1094(J)
gastrointestinal absorption and bone deposition of, effect of concentration of Pu in diet on, 9: 501
irradiation of napkin rings of, 9: 4976
magnetic susceptibility of, effects of temperature, 9: 599(J)
neutron irradiation of, Bk and Cf isotopes produced by, 9: 1489(J)
neutron total cross section, energy dependence, 9: 7862(J)
optical spectrum, isotopic shift, 9: 4977(J)
physical properties, 9: 2682(J)
production of, in heavy water reactors, 9: 1081(J)
Plutonium (cont'd)
properties and reactor applications, 9: 6476
radiometric determination of, in presence of U, 9: 1598
separation of transplutonic elements from, design of equipment for, 9: 571(J)
separation plants and procedures, 9: 590(J)
separation process and facilities at Harwell, 9: 591(J)
spectra, Zeeman effects in, 9: 4111(J)
spectrum, hyperfine structure, 9: 6627(J)
tissue distribution of, effects of Zr on, in rats, 9: 3(R)
titrimetric and radiometric determinations, ANL procedures for, 9: 4074
Plutonium alloys
properties and reactor applications, 9: 6476
Plutonium arsenides
preparation, composition, and crystal structure, 9: 5347
Plutonium compounds
determination of free acid in solutions of, 9: 4110
polarographic behavior of, in molten ammonium formate, 9: 7292
Plutonium deuterides
heat of formation, 9: 5930(J)
Plutonium(III) fluorides
heats and free energies of sublimation and vapor pressure of, at elevated temperatures, 9: 3800(J)
vapor pressure measurement, 9: 5410(J)
Plutonium(IV) fluorides
hydrated, preparation and properties, 9: 1210(J)
preparation, hydration, thermogravimetric analysis, x-ray diffraction analysis, precipitation from aqueous solution, and reactions with aqueous hydrofluoric acid, 9: 1210(J)
Plutonium hydrides
heat of formation, 9: 5930(J)
Plutonium–hydrogen systems
phase studies, 9: 5930(J)
Plutonium(VI) ions
determination of, in solutions, 9: 4110
Plutonium isotopes
chemical separation after proton irradiation of natural U, 9: 2673(J)
Plutonium isotopes Pu^{238}
alpha cross sections, 9: 4705(R)
alpha spectrum, measurement, 9: 7905(J)
conversion electron spectrum, 9: 4864
energy levels, spins and parities assigned to, 9: 6123(J)
gamma spectra, 9: 7272(R)
Plutonium isotopes Pu^{239}
alpha and deuteron cross sections, 9: 4705(R)
alpha spectrum, measurement, 9: 7905(J)
deuteron cross sections (d,xn), 9: 7272(R)
effects of intravenous injection in dogs, 9: 6843(J)
epithermal neutron fission, number of secondary neutrons in, 9: 7934(J)
fission, thermodynamic theory of, 9: 5507(J)
fission cross section at 0.01 to 0.95 ev, 9: 1093(J)
fission cross section data presented at Geneva conference, 9: 7101(J)
fission products, study after long intense neutron irradiation, 9: 2136(R)
metastable level in, of half-life 193 mμ sec, 9: 6125(J)
neutron cross sections and reactor constants, 9: 5762
neutrons emitted in fission, measurements of average number, 9: 7932(J)
nuclear spins, 9: 5146(J)
optical spectra, hyperfine structure, 9: 5146(J)
slow neutron fission cross sections and fission resonances, 9: 6557(J)

Plutonium isotopes Pu^{239} (cont'd)
thermal neutron fission cross section, 9: 6044(J)
velocity fine structure of fission fragments, 9: 1365(J)
Plutonium isotopes Pu^{240}
alpha spectrum, measurement, 9: 7905(J)
conversion electron spectrum, 9: 4864
deuteron cross sections, 9: 4705(R)
neutrons emitted in fission, measurements of average number, 9: 7932(J)
Plutonium isotopes Pu^{241}
determination of thermal neutrons per fission in, 9: 7095
neutron cross sections and reactor constants, 9: 5762
neutrons emitted in fission, measurements of average number, 9: 7932(J)
thermal neutron fission cross section, 9: 6748
Plutonium isotopes Pu^{242}
alpha cross sections, 9: 4705(R)
Plutonium(IV) oxides
fluorination with hydrogen fluoride and aqueous hydrofluoric acid, 9: 1210(J)
Plutonium phosphides
preparation, composition, and crystal structure, 9: 5347
Plutonium selenides
preparation, 9: 5347
Plutonium tellurides
preparation, composition, and crystal structure, 9: 5347
Pocket chambers
with built-in charger, for personnel protection from x and γ radiation, 9: 1328(J)
design of integrating ionization, of nearly uniform polar response, 9: 4249(J)
effect of body backscatter on, 9: 3953(J)
Pocono Formation (Penna.)
exploration and geology of, 9: 164(J)
Poison Canyon Deposits (N. Mex.)
occurrence of U deposits in, mineralogy of, 9: 5948(R)
Poison Spring Canyon Area (Utah)
mineralogy, 9: 1829
Poisoning
of animal cells, effects of x radiation and various chemicals, 9: 5577(J)
Polar Mesa (Utah)
geophysical exploration, stratigraphy and U distribution, 9: 160
Polarographs
recorded in fused salts with platinum electrodes, 9: 5264(J)
square-wave, design and performance, 9: 3402(J)
Polarography
controlled stirring apparatus with stationary electrode for use in, 9: 5412(J)
electrolytes for determination of U by, 9: 1149(J)
electrolytes for determination of U by, in presence of other ions, 9: 1150(J)
equipment for, in determination of Pb in Be, 9: 5273(J)
of inorganic compounds in molten ammonium formate, 9: 7292
overvoltage of H liberation on Pt, influence of surface-active agents on, 9: 5386(J)
techniques of, book on, 9: 6602(J)
theory of slow electrode reaction in, 9: 4064(J)
Poliomyelitis
virus, effects of radiation on, 9: 491(J), 3737(J)
Polishing
(See also Cleaning; Electrolytic polishing.)
Polishing (cont'd)
methods for, of W and Mo metallographic specimens, 9: 1865(J)
universal method for, for metallography, 9: 3879(J)
Polonium
absorption, tissue distribution, and excretion, gastrointestinal and intravenous administration studies, in cats, 9: 5874
alpha activity from, measured by kinetic nucleography, 9: 713(J)
diffusivity into nickel and lead, 9: 6257(J)
distribution, excretion, and retention of, in rats, 9: 1705
distribution of, in blood fractions, following injection in rats, tracer study, 9: 509(J)
distribution of, in blood of rats and dogs, 9: 1708(J)
effects of a maintained body burden of, on mortality, life span, and growth in rats, tracer study, 9: 5584
electrochemical determination of, in urine, equipment for, 9: 5257
electrodeposition of, apparatus for measuring, 9: 3757
electrodeposition on gold, 9: 6601(J)
extraction by mesityl oxide, 9: 2674(J)
ion exchange of, from Bi at room temperature, 9: 503(J)
neutron spectrum from, 9: 1346(J)
radiometric determination, 9: 2634
segregation to grain boundaries in Bi–Pb alloys, 9: 3186(J)
solubility in HNO_3, 9: 4060
spectrum and electron energy levels, 9: 4638
thermodynamic properties, 9: 5597(J)
tissue distribution of, in rats, 9: 4055
tissue distribution of, in rats, tracer study, 9: 5583
Polonium chlorides
preparation and crystal structure, 9: 6601(J)
Polonium complexes
absorption spectra of, in HCl solutions, 9: 4365
Polonium compounds
composition of polonium dithizonate, 9: 4069(J)
Polonium isotopes
alpha decay in, relation to shell model, 9: 1999(J)
alpha spectra of light, 9: 1410(J)
spectrographic analysis of, for Po^{208} and Po^{209}, 9: 76
Polonium isotopes Po^{206}
alpha spectra, 9: 7272(R)
Polonium isotopes Po^{207}
decay scheme and spectra, 9: 7185
internal conversion electrons in the decay of, 9: 7185
Polonium isotopes Po^{208}
gamma spectra, 9: 4705(R)
spectrographic determination of, in Po^{208}–Po^{209} mixtures, 9: 76
Polonium isotopes Po^{209}
gamma spectra, 9: 4705(R)
gamma spectrum and decay scheme, 9: 6117(J)
spectrographic determination of, in Po^{208}–Po^{209} mixtures, 9: 76
Polonium isotopes Po^{210}
alpha decay, internal ionization from, 9: 6536(J)
alpha disintegration of, study of α–e^- coincidences in, 9: 6525(J)
decay, branching ratio in, 9: 2512(J)
photography, 9: 5096
preparation of, by vacuum-sublimation of Po deposited on Ag, Ni, and Pt, 9: 2219(J)
radiocolloidal properties of, 9: 62
toxicity of, in rats, 9: 4055

Polonium isotopes Po^{211}

radiation of great track length from, 9: 808(J)

Polonium isotopes Po^{212}

angular correlations (α-γ), 9: 2974(J)

Polonium isotopes Po^{213}

decay schemes and nuclear spectra, 9: 4863

Polonium isotopes Po^{214}

gamma cascades, 9: 7199(J)

gamma emission, intensity measurement of, 9: 6803(J)

Polonium isotopes Po^{215}

radiation of great track length from, 9: 808(J)

Polonium–lead alloys

preparation and crystal structure of PbPo, 9: 5625

Polonium–mercury alloys

preparation and crystal structure of HgPo, 9: 5625

Polonium nitrates

solubility in HNO_3, 9: 4060

Polonium oxides

heat and free energy of formation, 9: 529(J)

Polonium(IV) oxides

preparation and crystal structure, 9: 2219(J)

Polonium sources

(See Alpha sources.)

Polycrystals

(See also specific polycrystals.)

thermal neutron inelastic scattering in, influence of thermal motion on, 9: 7499(J)

Polycythemia

cobalt-induced, effects on radiosensitivity in rats, 9: 7243(J)

Polymerization

(See also appropriate subheadings under specific materials.)

of ethylene produced by γ radiation, 9: 1550(R)

methods of producing, in various compounds, 9: 6235

of methyl methacrylate, by γ radiation, 9: 5916(J)

of N-vinylpyrrolidone induced by exposure to γ radiation, 9: 1781(R)

of organic compounds produced by radiation, 9: 7308(J)

rate, initiated by free radicals, 9: 4936(J)

Polymers

(See also specific polymers, e.g., Styrene polymers.)

charged, distribution of, at equilibrium in a centrifugal field, 9: 525(J)

compression of, at high pressures, temperature dependence, 9: 863(J)

dynamic mechanical properties of, apparatus for measuring, 9: 2239(J)

high-temperature resistant, synthesis and properties, 9: 3799

infrared studies of, as a means for estimating deterioration, literature survey, 9: 3115

inorganic, preparation and properties, 9: 4107

long-chain, gel formation by main-chain fracture of, 9: 7690(J)

mechanical properties of, literature survey, 9: 3452

molecular weights of, charged, in presence of supporting electrolyte, and errors due to neglect of this charge, 9: 525(J)

physical and chemical properties, effects of irradiation on, 9: 7725(J)

physical properties, effects of pile radiation on, 9: 7722

preparation of, containing Al–O–Si bonds, 9: 6873(R)

preparation of, various methods, 9: 6235

properties and synthesis of organic and semi-organic, 9: 6867(R)

structure, effects of neutron and gamma irradiation on, 9: 6613(J)

Polymers (cont'd)

synthesis and molecular weight determination, 9: 6218(R)

synthesis and properties of, effects of radiation on, 9: 1785(J)

thermal conductivity of silicone and hydrocarbon, 9: 2336(J)

Polyphenyls

(See also Biphenyl; Terphenyl.)

determination of biphenyl in mixtures, 9: 4723

fluorinated, mass spectrographic analysis of, 9: 5262(J)

lubricity, properties, and testing, 9: 6181(R)

meta-, molecular weight determination, 9: 6925

Polystyrene

(See Styrene polymers.)

Polytechnic Inst. of Brooklyn

(See Brooklyn. Polytechnic Inst.)

Polythene

(See Ethylene polymers.)

Populations

(See also Genetics; Statistics.)

biological effects of radiation from nuclear explosions and nuclear power on, 9: 4921(J)

congenital malformations in, from exposure to x radiation, 9: 3025(J)

of Drosophila, synthetic lethals in, 9: 7606

of finite variance, efficiency of the sample median in statistical analysis, 9: 3586

genetic damage to, from radiation, 9: 5226(J)

long-range hazards of radiation to, 9: 7248(J)

multiple sampling applied to statistical analysis of, 9: 2103

natural, of Drosophila, genetic factors, 9: 5(R)

statistical analysis of, moments of the sample median, 9: 3585

of tumor cells, growth calculations of, by Monte Carlo method, 9: 6822

of yeasts, effects of physical and chemical environment and exposure to x radiation, 9: 1712

Porcelain

mechanical properties of, 9: 1820(R)

Porcelain enamels

decontamination characteristics of, 9: 617(J)

Porosity

(See also Permeability.)

determination of pore size distribution from adsorption isotherms, 9: 2216(J)

effect on constant rate filtration, equations, 9: 5302(J)

effects on thermal stress fracture, 9: 1507(J)

Porous materials

(See also specific entries, e.g., Graphite; Uranium oxide compacts.)

heat transfer by radiation, 9: 4779(R)

laminar flow through, theory, 9: 5937

operating characteristics of porous-glass membranes, 9: 7747(J)

physical properties of composite media, 9: 7392

Porphyrins

effects of, on radiosensitivity of dividing cells in paramecium, 9: 6847

structure, by LCAO MO method, 9: 4099(J)

tissue distribution of, in normal and tumor-bearing mice, tracer study, 9: 4039(R)

Positronium

annihilation radiation, 9: 3965(R)

decay of ortho-, angular dependence of magnetic field quenching, 9: 5818(J)

Positronium (cont'd)
formation in gases, pressure dependence, 9: 4612(J)
review on, in Annual Review of Nuclear Science, 9: 4007(J)
spectrum in external fields, 9: 6517(J)
Positrons
absorption and transmission in elements of high atomic number, 100 to 150 kev, 9: 6367(J)
absorption of, in Cu and Cd, 9: 415(J)
angular correlation of photons from annihilation of, in solids, 9: 6766(J)
annihilation, angular correlation of 2-quantum, 9: 7560
annihilation by electrons, multiphoton, 9: 6773(J)
annihilation in light metals, angular correlation of γ radiation from, 9: 4586(J)
annihilation of, in liquids and solids, 9: 2938(J)
annihilation of, in metals, angular distribution of γ rays from, and measurement of electron momentum by, 9: 6793(J)
annihilation of, in various materials, angular correlation of radiation from, 9: 4312(J)
Coulomb scattering of high-energy, by nuclei, 9: 3671(J)
electron capture transitions in the decay of Na^{22}, 9: 6697(J)
formation of monochromatic, analysis, 9: 1910(J)
multiphoton annihilation with electrons, 9: 7050(J)
multiple scattering by N and A, 9: 5798(J)
nuclear scattering of, at 0.7 and 1.4 Mev, 9: 4611(J)
production of monoenergetic, analysis of, 9: 6364(J)
symmetrical theory of, and electrons, 9: 7584(J)
temperature effects of annihilation of, in methyl alcohol, water, and glycerine, 9: 6792(J)
thermalization in metals, 9: 4001(J)
three-photon annihilation of electron-positron pairs, 9: 669(J)
three-quantum annihilation of, in various materials, 9: 249(J)
Potassium
chemical reaction with HBr, mechanism, 9: 7687(J)
chromatographic determination of, in mixtures of Na, K, Mg, and Ca, 9: 3400(J)
computed transition probabilities for x-ray continua, 9: 5191(J)
cosmic abundance of, in chondritic meteorites, 9: 3065(J)
direct determination by precipitation as potassium fluoborate from ice-cold solution, 9: 2175(J)
distribution of, in brain tissue, tracer study, 9: 2099(R)
entropy at 25°K, 9: 2735(R)
exchange with Na across erythrocyte surface, tracer study, 9: 2099(R)
heat capacity between 12 and 320°K and entropy at 25°C, 9: 4482(R)
ion exchange separation from Ca and Mg and titrimetric determination of, 9: 1200(J)
quenching of resonance radiation by H_2 and D, 9: 243(J)
reaction with $BF_3 \cdot NH_3$, 9: 515
spectrophotometric determination of, in siliceous, argillaceous, and phosphate rocks, 9: 78
surface energies and temperature coefficients, 9: 6669(J)
thermodynamic properties, 9: 7282(J)
transport of, in human erythrocytes, tracer study, 9: 1735(J)
Potassium (liquid)
surface tension of, by drop-weight method, 9: 527(J)
viscosity, 9: 1277(J)
Potassium amide
reaction with $BF_3 \cdot NH_3$, 9: 515
Potassium–antimony alloys
crystal structure, 9: 1893(R)
Potassium–bismuth alloys
microhardness and surface tension, 9: 3527(J)
Potassium borates
coloration, 9: 4314(J)
Potassium bromide crystals
fluorescence and thermoluminescence in x-irradiated, 9: 3682(J)
radiosensitivity, 9: 4243
Potassium bromide–potassium chloride systems
ionic conductivity, 9: 4709(J)
Potassium bromides
absorption spectra of irradiated, 9: 6868
emission, excitation, and absorption spectra of Ag-activated, 9: 3116(J)
luminescence of Ni and Cu activated, excited by x rays, 9: 3230(J)
Potassium chloride–aluminum chloride systems (liquid)
electric conductivity, 9: 2613
Potassium chloride–cadmium chloride systems (liquid)
electric conductivity, 9: 2139(J)
Potassium chloride–calcium chloride–lithium chloride systems
phase studies, 9: 4059
Potassium chloride–copper chloride systems (liquid)
electric conductivity, 9: 2139(J)
Potassium chloride crystals
additive coloring reaction in, reversibility, 9: 2330
dimensional stability, effects of radiation on, 9: 5276
electric conductivity and mechanical properties, effects of radiation on, 9: 800(R)
fluorescence and thermoluminescence in x-irradiated, 9: 3682(J)
state of colloidal particles, 9: 2330
thermal conductivity, 9: 7389(R)
Potassium chloride–lead chloride systems
thermodynamic properties, 9: 7094(J)
Potassium chloride–lead chloride systems (liquid)
electric conductivity, 9: 2139(J)
Potassium chloride–lithium chloride–potassium fluoborate systems (liquid)
electrolysis of, in temperature range 350 to 500°C, 9: 52
Potassium chloride–magnesium chloride systems
thermodynamic properties, 9: 7108(J)
Potassium chloride–potassium bromide systems
ionic conductivity, 9: 4709(J)
Potassium chloride–potassium systems
properties, heat of reaction, and reaction mechanisms, 9: 852
Potassium chloride–sodium chloride systems (liquid)
explosions with water, prevention of, 9: 1743
Potassium chlorides
adsorption on gold surfaces, 9: 3766
adsorption on powdered silver, 9: 3432(J)
coloration and luminescence of, radiation-induced, 9: 4314(J)
effects of soft x rays on lattice of, 9: 5180(J)
electronic structure of V centers in, 9: 6546(R)
emission, excitation, and absorption spectra of Ag-activated, 9: 3116(J)
energy band structure, theory, 9: 231(R)
ionic conductivity of, with $BaCl_2$ and Sm additions, 9: 4709(J)
vapor pressure lowering of water by addition of, 9: 524(J)
Potassium chloromolybdates(III)
electrolysis of, dissolved in molten alkali halides for preparation of Mo, 9: 2221(J)

Potassium chloromolybdates(III) (cont'd)
preparation of, 9: 2222(J)
Potassium chromates
effects on Al corrosion, 9: 4143(J)
Potassium compounds
polarographic behavior of, in molten ammonium formate, 9: 7292
Potassium cyanides
radiation protection, 9: 2599(J)
Potassium fluoborate–lithium chloride–potassium chloride systems (liquid)
electrolysis of, in temperature range 350 to 550°C, 9: 52
Potassium fluoborate–potassium metaborate–potassium tetraborate systems (liquid)
electrolysis of, in temperature range 350 to 550°C, 9: 52
Potassium fluoborates
direct determination of K by precipitation of, from ice-cold solutions, 9: 2175(J)
toxicity, 9: 4054
Potassium fluoride–hydrofluoric acid systems
solid-liquid equilibria, 9: 4741
Potassium fluoride–lithium fluoride–sodium fluoride systems
thermal capacity and enthalpy, 9: 634(R)
Potassium fluoride–potassium systems
phase studies and vapor pressure, 9: 3771(J)
Potassium fluoride–sodium fluoride systems
relative position in the electrochemical series of Al, Mn, Cr, and Ni dissolved in, 9: 6310(J)
Potassium fluorides
fluorescence and thermoluminescence in x-irradiated crystals of, 9: 3682(J)
Potassium fluotitanates
electrolysis of, for preparation of Ti, 9: 5365(J)
preparation, 9: 5365(J)
Potassium hydroxides
infrared spectra of natural and hydrated, at room and liquid-air temperatures, 9: 3434
in solution, determination of, design of a radio-frequency oscillator for, 9: 5285
Potassium hydroxides (liquid)
water vapor pressure determination over, 9: 4708(J)
Potassium iodates
fission recoil of I^{131} from U oxide particles into, chemical effects, 9: 3422(J)
Potassium iodide crystals
fluorescence and thermoluminescence in x-irradiated, 9: 3682(J)
response of thallium-activated, to fission fragments, 9: 1606(J)
Potassium iodides
exchange reaction with benzyl iodides, 9: 4414, 6179
proton synchrotron beam size determination with probe of, 9: 7871(J)
radiolysis of aqueous solutions, 9: 7718(J)
Potassium ions
activity measurements with resin membrane electrodes, 9: 2149(J)
conductometric determination of, in paper chromatograms, design and performance of apparatus for, 9: 2215(J)
isotopic effect of the electrolytic diffusion of, in molten KNO_3, 9: 5387(J)
Potassium isotopes
mass ratios of, determined from microwave spectra of alkali halides, 9: 611(J)
Potassium isotopes K^{38}
decay and half lives, 9: 1680(J)
Potassium isotopes K^{38} (cont'd)
half life, 9: 2951
Potassium isotopes K^{39}
alpha reactions (α,p), ground state Q values from, 9: 2441(J)
gamma reactions (γ,nα), 9: 3674(J)
nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)
nuclear electric quadrupole moment, 9: 4865(J)
Potassium isotopes K^{40}
beta spectrum, 9: 6516(J)
branching ratio, 9: 988(R), 7200(J)
contribution of, to natural radioactivity of man, 9: 444(J)
decay into A^{40} in dating of archeological specimens, 9: 3463(J)
in determination of geological age of meteorites, 9: 5949(J)
electromagnetic separation, 9: 1956
in vivo determination of, in human skeleton, 9: 1980(J)
nuclear magnetic moment, 9: 988(R)
nuclear magnetic moment of, calculated by proton-neutron coupling, 9: 742(J)
ratio to A^{40} in meteorites, age determination by, 9: 1915(J)
tissue distribution of, in human body, radiometric determination, 9: 6820(R)
Potassium isotopes K^{41}
alpha reactions (α,p), ground-state Q values from, 9: 2441(J)
mass difference with A^{41}, 9: 7113(J)
nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)
Potassium isotopes K^{42}
beta spectra, 9: 1994(R), 3965(R)
branching ratio, determination, 9: 4625(J)
determination of, in body fluids, simultaneously with determination of Na^{24}, 9: 1465(J)
gamma radiation from, counting in the presence of Na^{24}, 9: 2429(J)
in measurements of total exchangeable Na and K, 9: 4696(J)
tracer applications in measurement of cardiac output, 9: 4364(J)
Potassium metaborate–potassium fluoborate–potassium tetraborate systems (liquid)
electrolysis of, in temperature range 350 to 550°C, 9: 52
Potassium niobates
crystal structure, and nuclear resonance of Nb^{93} in, 9: 1351(J)
Potassium nitrates
effect on the vapor tension and calorimetry of 100% and aqueous solutions of nitric acid, 9: 2140(J)
perpendicular bending frequency in, N^{15} isotope shift, 9: 919(J)
radiolysis of aqueous solutions of, effect of solutes on yields in, 9: 7716(J)
Potassium perchlorates
diffusion coefficients of, in dilute aqueous solutions at 25°, 9: 4372(J)
Potassium–potassium chloride systems
properties, heat of reaction, and reaction mechanisms, 9: 852
Potassium–potassium fluoride systems
phase studies and vapor pressure, 9: 3771(J)
Potassium rhenides
crystal structure, 9: 6868
Potassium salts
beta ionization intensity from, 9: 5814
Potassium–sodium alloys
determination of O_2 in, with butyl bromide, 9: 7700(J)

Potassium–sodium alloys (cont'd)
thermodynamic properties, 9: 2735(R)
Potassium–sodium alloys (liquid)
circulation systems, instrumentation, 9: 4179(R)
corrosion of Zr and stainless steel and analysis of, 9: 1254
corrosive effects on electrical insulating materials, 9: 4179(R)
equilibrium solubility of Fe in, equipment and procedures for studying, 9: 3501
fluid flow in annuli and heat transfer coefficients between, 9: 6251(J)
friction factor, effects of Reynolds Number on, 9: 4179(R)
handbook, 9: 6664
heat and mass transfer, 9: 6099(R)
heat-transfer coefficients of Zr tubing in, 9: 1254
heat transfer in cross-flow heat exchanger, 9: 6247
heat-transfer properties and electrical resistance, 9: 4179(R)
heat-transfer systems, description and operation, 9: 6953
sampling, 9: 4179(R)
viscosity, 9: 1277(J)
wear of, stainless steel bearings in, 9: 2280
wetting of surfaces with, heat transfer in, 9: 4175(R)
Potassium tetraborate–potassium fluoborate–potassium metaborate systems (liquid)
electrolysis of, in temperature range 350 to 550°C, 9: 52
Potassium uranium fluorides
crystal structure, 9: 2227(J)
Potassium uranyl fluorides
crystal structure, 9: 2225(J), 2227(J)
Potassium zirconium fluorides
electrolysis of, to produce Zr metal, 9: 3201(J)
Potatoes
effects of γ radiation on taste and storage life, 9: 2552(J)
Potentiometers
design, testing, and construction of recording precision microvolt, 9: 2792(R)
design and construction, 9: 518
for measuring emf of thermocouples, design and performance, 9: 1581
metallic-film high-temperature, development, 9: 5074
recording microvolt, performance, 9: 5247(R)
Potentiometric analysis
of aqueous ferrous solutions by x-ray oxidation, 9: 2644(J)
Pottsville Formation (Penna.)
geology and U distribution, 9: 164(J)
Pottsville Formation (W. Va.)
stratigraphy and occurrence of radioactive coal and shale in, 9: 6268
Powder metallurgy
(See also appropriate subheadings under specific materials.)
applicability of, to problems of high-temperature materials, review, 9: 198(J)
development of, review, 9: 2302(J)
friability test as method of evaluating sinter cake, 9: 2244(J)
surface area determination of powders by gas adsorption, 9: 6955
Powder Metallurgy Lab., Rensselaer Polytechnic Inst.
(See Rensselaer Polytechnic Inst., Troy, N. Y. Powder Metallurgy Lab.)
Powder River Basin (Wyo.)
exploration, 9: 1514(R)
uranium bearing sandstone and coal deposits in, 9: 2263
Powders
(See also specific powders; see also Metal Powders; Particles.)
Powders (cont'd)
analysis of continuity of one phase in a powder mixture of two phases, 9: 2243(J)
density of, measured by gas burette, 9: 1290(J)
determination of specific surface of sieve-size methods, 9: 2622(J)
fine, flow properties, 9: 4126(R)
fine, particle size measurement, 9: 1291(J)
particle size and tapped density, determination, 9: 4778
preparation of, from ground sinter cake, 9: 2244(J)
size reduction, review, 9: 3232(J)
surface area determination by gas adsorption, 9: 6955
Power plants
(See also Nuclear power plants; Steam power plants; Submarine power plants.)
economic study, 9: 7920
technology and economic aspects, 9: 4424(J)
Power reactors
(See also Aircraft reactors; Nuclear power; Package power reactors; Sodium graphite reactors; Submarine Advanced Reactor; Submarine Intermediate Reactor; Submarine Thermal Reactor.)
coolants, a summary, 9: 5568(J)
costs, reduction, 9: 1642(J)
design, 9: 3293(J), 3294(J)
design, a comparison of types, and economic factors affecting development, 9: 5203
design and cost factors, 9: 756(J)
design and cost factors of Homogeneous Reactor Experiment, 9: 5777(J)
design features of existing and planned, 9: 7153(J)
design of British Calder Hall power station, 9: 372(J)
dual-cycle boiling water, performance improvement by flask tank feedwater subcooling, 9: 7532(J)
dual-cycle design, 9: 7532(J)
dynamics and control, 9: 7919
fuel element loading equipment, 9: 5497(J)
heterogeneous, advantages of, 9: 1357(J)
nuclear fuel and inventory costs, 9: 370
plant layout problems, 9: 5494(J)
pressurized-water, water purification requirements, 9: 5495(J)
proposed, for Italy, 9: 2908(J)
summary reports to AEC on, 9: 4568(J), 4569(J)
Power supplies
(See also Current regulators; Electric power; Voltage regulators.)
Bevatron, installation, 9: 5167
constant-potential, for sigma welding, 9: 210(J)
d-c voltage output and ripple, effect of operating conditions, 9: 5101(J)
design for use with photomultiplier tube in recording microphotometer, 9: 7432
high-voltage, design and performance, 9: 656
high-voltage, for neutron survey equipment, design, 9: 3250
for magnet coil of high-energy proton synchrotrons, 9: 1098
in neutron flux measurement systems, 9: 7454(R)
precision high-voltage, suitable for use with ionization chambers, 9: 3244(J)
pulsed, for synchrotron magnet supply, design, 9: 5162
radioactive and photoelectric p-n junction power sources, 9: 251(J)
regulated d-c, 9: 7070(R)
transistor high-voltage, for portable Geiger counters, 9: 1944
Praseodymium
1:1 compounds with Bi, preparation and crystal structure, 9: 5620(J)

Praseodymium (cont'd)

1:1 compounds with P, preparation and crystal structure, 9: 5619(J)

paramagnetic resonance absorption spectra, 9: 2075(J)

polarographic studies, 9: 5602(J)

solvent extraction of, into TBP and into a TBP and TTA mixture in kerosene, 9: 906

spectra, 9: 4963

Praseodymium chlorides

paramagnetic resonance absorption, 9: 2072(J)

Praseodymium complexes

with cupferron, pyrolysis, 9: 5920(J)

Praseodymium compounds

hyperfine structure in spectrum of, 9: 6542(J)

preparation and structure of arsenides and antimonides, 9: 5293(J)

Praseodymium(III) ions

thermodynamic formation constants in aqueous solution for reaction of, with acetylacetonate at 30°C, 9: 1191(J)

Praseodymium isotopes

neutron-deficient, half lives and decay, 9: 1131(J)

Praseodymium isotopes Pr^{141}

half life of the 145-kev level of, 9: 7111(J)

Praseodymium isotopes Pr^{142}

gamma emission, 9: 1407(J)

intensity of second β spectrum in, 9: 7192(J)

Praseodymium isotopes Pr^{143}

gamma emission, 9: 1407(J)

Praseodymium isotopes Pr^{144}

gamma spectra, 9: 1402(J), 1403(J)

Praseodymium nitrates

preparation and structure, 9: 5292(J)

preparation of anhydrous, by reaction of oxides and NO_2, 9: 112(J)

Praseodymium oxide–uranium oxide systems

phase studies and crystal structure, 9: 6943(J)

Praseodymium oxides

phase studies of, between PrO_2 and Pr_2O_3, 9: 114(J)

preparation of, by high-pressure molecular O treatment, 9: 903(J)

x-ray and differential analysis of, in the composition range Pr_2O_3 to Pr_6O_{11}, 9: 110(J)

Precipitation

organic compounds as agents for, in analytical chemistry, 9: 7704(J)

Pressure

(See also High-pressure systems; Vapor pressure.)

automatic recorder for, for study of gas-phase kinetics, 9: 2834(J)

bibliography and index on measurement of dynamic, and related subjects, 9: 3223(J)

methods of measurement, 9: 3547(R)

Pressure drop

(See also Fluid flow; Gas flow; Liquid flow.)

elastic, for 460- to 660-Mev protons on protons, 9: 2491(J), 2493(J), 2934(J), 2935(J), 4889(J), 4890(J), 4891(J)

in liquid flow through a perforated-plate assembly, 9: 4771

in starting area of air-passed slots, 9: 2230(J)

two-phase, in steam-water mixtures, evaluation, 9: 6243

Pressure gages

(See also Hypsometers; Manometers; Vacuum gages.)

design, 9: 5110

Pressure gages (cont'd)

design, for SIR cooling system, 9: 272

design of, for measuring static gas pressure around body moving in air, 9: 1429(P)

electromagnetic, design, 9: 7989(P)

electromechanical, evaluation, 9: 4416

high-temperature, testing, 9: 5657(R), 6999(R)

for high-vacuum systems, design, 9: 4841

for liquid metals, design and testing, 9: 4179(R)

piezoelectric crystal, for recording air blast pressure transients, 9: 6374

Pressure transmitters

design, for SIR cooling system, 9: 272

hermetically sealed high-temperature, 9: 7058

Pressure vessels

(See also Tanks.)

biaxial fatigue properties of high-strength steels for, 9: 4196(J)

charts and nomographs for design of, 9: 3441(J)

design, fatigue strengths of metals as consideration in, 9: 214(J)

design of, with internal window, 9: 4423(J)

design of welded, using quenched and tempered steel, 9: 7365(J)

insulating seal for electrical connections to, 9: 5935(J)

plastic fatigue properties of high-strength steels for, 9: 4195(J)

quenched and tempered steels for, properties and characteristics 9: 7364(J)

shell design nomenclature, 9: 6673(J)

suitability of quenched and tempered steels for, construction, 9: 7366(J)

welding procedure qualification tests on 3 pairs of high-strength steels for, 9: 4198(J)

Prisms

resolving power, 9: 2522(J)

Promethium

tissue distribution of, in rats, tracer study, 9: 2730(R)

Promethium isotopes Pm^{147}

half life determination, 9: 4656(J)

Promethium isotopes Pm^{149}

disintegrations and decay scheme, 9: 1671(J)

Promethium isotopes Pm^{151}

disintegration of, coincidence studies, 9: 3686(J)

Propane

chemical effect on H_2–O_2 reactions, 9: 7274

Propane, bromo-

isotopic exchange reactions with LiBr in acetone, 9: 5593(J)

nuclear reactions (n,γ) in, effect of γ radiation on, 9: 5915(J)

Propane, 2-bromo-2-methyl-

isotopic exchange reactions with LiBr in acetone, 9: 5593(J)

Propane, 2-chloro-2-methyl-

reactions of, chlorine isotope effect in, 9: 67(J)

Propane, heptafluoro-

dielectric constants, 9: 6213(J)

Propanedioic acid

(See Malonic acid.)

1,2-Propanediol, hexafluoro-

reaction with butyl formal, 9: 1767(R)

1-Propanol–toluene–water systems

solubility diagrams and physical properties, 9: 7272(R)

Propene, 2-methyl-
polymers, effects of radiation on, 9: 5617(J)

Propionic acid, α-amino-
(See Alanine.)

Propionic acid, pentafluoro-
chemical reactions with C_6H_5Li in ether, 9: 5928(J)

Propionic acid–water systems
activity coefficients, 9: 4713(J)

Propionitrile
direct fluorination, 9: 890

Propiophenone, p-amino-
protective effects of, against radiation damage to hematopoietic tissues in rats, 9: 6580(J)

Proportional detectors
absolute disintegration rates by, 9: 3603(J)
borazole filled, counting properties for detection of thermal neutrons, 9: 2417
calibration of, for fast neutron detection, 9: 5422
dating of C^{14} with, filled with CO_2, 9: 3593(J)
design and operation of, of uniform sensitivity, 9: 716(J)
design and theory, 9: 7859(J)
for detection of fast neutrons, design and performance, 9: 3252
external cathode, performance, 9: 1330(J)
high pressure, for fast neutron spectroscopy, 9: 7068
high-pressure, for studying ionization energy loss of fast μ mesons, 9: 2489(J)
mesic x-ray detection by, 9: 7870(J)
minimum particle trajectory necessary for detection, determination of, 9: 2099(R)
neutron flux measurements with BF_3, 9: 7452
performance at low pressures, 9: 4842(R)
performance of, for detecting fast neutrons in the presence of γ radiation, 9: 3934
performance of, in detection and measurement of neutrons, 9: 7451
performance of, in measurements of neutron dose as function of linear energy transfer, 9: 6007(J)
pulse analysis with, 9: 7448
recoil, for detection of fast neutrons, performance, 9: 3951(J)
sensitivity of $B(CH_3)_3$, for neutrons, 9: 6444(R)
thin wide-aperture, design and performance of, 9: 1054(J)
using high-humidity gases, reduction of spurious pulses in, 9: 2871(J)
x-ray counting efficiency, 9: 4524(J)

Prospecting
(See also specific areas, mines, districts, etc., also specific elements or minerals sought; see also Exploration; Geochemical prospecting; Geophysical prospecting.)
a guide book for, for uranium, 9: 6657(J)

Prostate gland
blood-drop determination of Au^{198} in therapy of, 9: 3750(J)
carcinoma of, treatment with Au^{198}, 9: 4680(J)
selective uptake of Zn^{65} by dorsolateral prostate of rat, 9: 4662(J)

Protactinium
decay schemes and conversion electrons, 9: 383(J)
preparation, 9: 904(J)
separation from Fe by ion exchange in HCl–HF solutions, 9: 3102(J)

Protactinium bromides
preparation, 9: 904(J)

Protactinium chlorides
preparation, 9: 904(J)

Protactinium fluorides
preparation, 9: 904(J)

Protactinium hydrides
preparation, 9: 904(J)

Protactinium iodides
preparation, 9: 904(J)

Protactinium isotopes
beta-decay, rotational levels in, 9: 7525(J)

Protactinium isotopes Pa^{231}
alpha spectrum, measurement, 9: 7905(J)
metastable states, 9: 7272(R)

Protactinium isotopes Pa^{233}
metastable states, 9: 7272(R)

Protactinium isotopes Pa^{234}
gamma-beta branching ratio of UX_2 and half life of UZ, 9: 1126(J)

Protactinium oxides
preparation, 9: 904(J)

Protactinium oxysulfides
preparation, 9: 904(J)

Protective clothing
(See also Clothing.)
use of, in welding and cutting operations on radioactive process equipment, 9: 6670(J)

Proteins
elastic, for 460- to 660-Mev protons on protons, 9: 2491(J), 2493(J), 2934(J), 2935(J), 4889(J), 4890(J), 4891(J)
(See also Lipoproteins.)
aqueous solutions, effects of nitrogen mustard and x radiation on, 9: 6612(J)
biosynthesis, tracer study, 9: 3(R), 6820(R)
biosynthesis in plants, tracer study, 9: 4705(R)
biosynthesis of, in developing frog egg yolks, 9: 6899
biosynthesis of, in liver, tracer study, 9: 7234
biosynthesis of, in pancreas, 9: 4911(R)
from blood, protective effects against radiation injuries in mice, 9: 2598(J)
dietary, effects on excretion of nitrogen following total-body x irradiation, 9: 2568(J)
effects of ionizing radiations on solutions and complexes of, 9: 7616(J)
effects of radiation on, review of literature, 9: 2549
effects of x radiation on, mechanisms, 9: 4403(J)
radiation of, biochemical processes following, 9: 7615(J)
self-diffusion coefficients of water and ovalbumin in aqueous ovalbumin solutions, tracer study, 9: 1229(J)
serum, effects of radiation on, of rats having a benzopyrene-induced tumor, 9: 31(J)
solutions of, effects of x and ultraviolet radiation, 9: 5291(J)
solutions of, self-diffusion of water in, theory, 9: 1187(J)
spectral properties of muscle, effects of adenosinetriphosphoric acid, 9: 5924(J)

Proton beams
detection of, by induction electrode, 9: 5785(J)
external, from cyclotrons, device for stabilizing, 9: 2924
extraction of, from Liverpool system by regenerative method, 9: 6497(J)
focusing of, and therapeutic uses in irradiation of pituitary gland, 9: 7643
measurement of gas density with, 9: 1940(J)
polarization, detection by nuclear emulsions, 9: 6732(J)
potassium iodide probe size determination of, 9: 7871(J)
space charge effects, review, 9: 6780(J)

Proton cross sections
in medium weight elements, 9: 7123(J)
for nuclear interaction in light nuclei, 9: 5800(J)
ratio of probabilities for neutron and proton emission in medium weight nuclei, 9: 7122(J)
of reaction $B^{10}(p,\alpha)Be^{7}$, near 200 kev, 9: 6774(J)

Proton fission
of bismuth, energy dependence of, from 75 to 450 Mev, 9: 7553(J)
cross sections for Bi, Th, and U, 9: 7936(J)
of heavy elements for at 450 Mev, nuclear charge dependence, 9: 7552(J)
yield and symmetry in natural uranium and U^{235}, 9: 6144(J)

Proton scattering cross sections
elastic, for 660-Mev protons on protons, 9: 4886(J)
elastic, on protons at 950 Mev, 9: 6790(J)
measuring equipment for scattering by deuterons, 9: 2470(J)

Proton sources
high current, for linear accelerators, 9: 7160
operating characteristics of high-yield r-f, 9: 280(J)
regulating supply of H_2 for, Ni diffusion leak for, 9: 3440(J)

Proton synchrotrons
(See Synchrotrons.)

Proton total cross sections
of ten light elements and the neutron at 208 and 315 Mev, 9: 358(J)

Protons
(See also Cosmic protons.)
acceleration, geometrical considerations of helical wave guide for, 9: 6498(J)
angular distribution and yield of, from B^{10} (d,p)B^{11} reaction, 9: 406(J)
angular distribution from O^{16} (d,p)O^{17}, 9: 7902
angular distributions in (n,p) reactions, theory, 9: 2936(J)
angular distribution of, elastically scattered by proton, 9: 6790(J)
angular distributions of low-energy, from (d,p) reactions, theoretical analysis, 9: 5504(J)
annihilation of anti-, flight, 9: 261(J)
anomalous magnetic moment, 9: 3348(J)
asymmetry in p-n and p-p scattering from C, Li, and Be with 285-Mev polarized, 9: 7174(J)
asymmetry in p-n-p double charge-exchange scattering from C and Ta, 9: 7173(J)
attenuation cross sections for 860-Mev, scattered by Be, C, Al, Cu, Sn, and Pb, 9: 7172(J)
attenuation of 340-Mev, by U, 9: 778
bombardment of C targets by high-energy, production of neutrons in, 9: 1993(J)
bremsstrahlung, differential cross-section calculations, 9: 4205(R)
bremsstrahlung of, calculations of cross sections for, 9: 7171(J)
captured in Mg^{24} and Mg^{25}, positrons from, 9: 5817(J)
charge exchange with negative ions of atomic H, 9: 3672(J)
charge transfer cross sections for, in rare gases and H_2, 9: 2806(J)
coincidences (p,p) in Li, O, Al, and Cu produced by 340-Mev γ rays, 9: 7556(J)
collision of high-energy, with nuclei, 9: 1667(J)
collision with neutrons, neutral meson-deuteron production from, 9: 784(J)
collisions with 2.7 Bev protons, production of mesons from, 9: 6038(J)
Coulomb interference in pion-proton scattering at 120 Mev, 9: 5765(J)
detection and measurement of, from photonuclear reactions, 9: 1037
detection of, with thin plastic scintillators, 9: 7455
deuteron pickup by high-energy polarized protons, 9: 4609(J)

Protons (cont'd)
disintegration of aluminum by, in energy range 0.4 to 3.0 Bev, 9: 6074(J)
distribution in nuclei, 9: 7146(J)
distribution of, in heavy atomic nuclei, 9: 6802(J)
distribution of, in nucleus, equations, 9: 456(J)
elastic scattering, angular distribution measurements, 9: 2099(R)
elastic scattering by deuterons, 9: 2470(J)
elastic scattering by He, 9: 410(J)
elastic scattering by He at 0 to 20 Mev, direction of spin polarization produced by, 9: 5524(J)
elastic scattering by He at 9.76 Mev, 9: 4301(J)
elastic scattering cross sections of, by F^{19}, 9: 6101(J)
elastic scattering of, by fluorine, 9: 796(J)
elastic scattering of, by He^3 and T, 9: 7512(J)
elastic scattering of, by protons from 440 to 1000 Mev, angular distribution, 9: 3318(J)
elastic scattering of electrons from, angular distributions, 9: 4309(J)
elastic scattering of high-energy polarized, by complex nuclei, 9: 4895
elastic scattering of polarized, from complex nuclei, 9: 4893(J)
electron capture from He atoms by, 9: 1287(J)
emission probability from nuclear reactions in medium weight elements, 9: 7122(J)
energy loss by, in various gases, 9: 5803(J)
energy relations in nuclear emulsions, tables of, 9: 1557(J)
escape fraction from photographic plate for, produced by neutron beam, 9: 6034(J)
exchange scattering of 380-Mev neutrons on, 9: 4585(J)
fission and spallation of Bi by 660-Mev, 9: 7537(J)
fission of U, Bi, and W by, mechanism, 9: 7935(J)
focusing system for 600-Mev, in linear accelerators, 9: 1097
formation from 25-Mev bremsstrahlung reactions with deuterons, 9: 4599(J)
formation from $p + p \rightarrow d + \pi^+$ reaction at 460 Mev, 9: 4571(J)
gamma reactions (γ,π^0) from 170 to 340 Mev, 9: 1987(J)
H^4 production by 300-Mev, on carbon, search for, 9: 6079(J)
high-energy (n,p) collisions, phase shift analysis of scattering and polarization of, 9: 6448(J)
high-energy scattering of, 380 to 660 Mev, 9: 7908(J)
impact on H and Na, transition cross sections for, 9: 5794(J)
inelastic collisions with He atoms, 9: 1380(J)
inelastic p-p polarization in nuclei, 9: 7135(J)
inelastic scattering of, on nitrogen, resonances for, 9: 6453(J)
interactions of 1.37-Bev π mesons with, production of heavy unstable particles by, 9: 4257(J)
interactions with 4.5-Bev π^- mesons, 9: 7480(J)
interactions with negative pions at 1.4 bev, 9: 2940(J)
interactions with protons, 9: 3652(J)
ionization yield in argon, 9: 5755(R)
ionization yield in N, 9: 4266(R)
lifetimes of unbound and bound, lower limit for, 9: 994(J)
loss in synchrotrons through large angle scattering, 9: 6505(J)
magnetic moment, 9: 7529(J)
magnetic resonance absorption in linear polyamides, 9: 7503(J)
magnetic resonance measurement, 9: 366(J)
mass difference of neutrons and, 9: 732(J)
mass difference of neutrons and, by difference of electromagnetic self-energies, 9: 352(J)
mass difference theory, 9: 1078(J)

Protons (cont'd)
π^0-meson formation by 670-Mev, relation to absorber atomic weight, 9: 3607(J), 5453(J)
meson production by nucleon collisions, 9: 1069(J)
meson production by 657-Mev, on C and H, 9: 6737(J)
π-meson reactions, 9: 6035(R)
π^--meson reactions at 1 Bev with, $\Lambda^0-\theta^0$ production from, 9: 5461(J)
π^--meson reactions at 1.5 Bev, 9: 5525(J)
π-meson scattering, energy dependence of phase shifts in, 9: 5449
π-meson scattering by, tables, 9: 2930
π-meson scattering cross sections, second maximum in, 9: 7085(J)
monoenergetic, α disintegration of nuclei excited by, 9: 2917(J)
multiple Coulomb scattering and residual range in nuclear emulsions, relation between, 9: 4306(J)
multiple scattering in nuclear emulsions, 9: 2483(J)
neutron scattering by, angular distributions, 9: 6504(J)
nuclear disintegrations in nuclear emulsions produced by 950-Mev, 9: 7542(J)
in nuclear emulsions, 9: 7884(J)
nuclear reactions in Mg^{25}, compared to N^{14} reactions in C^{12}, 9: 1649(J)
nuclear reactions (p,2p), (p,2p) and (p,pn) with He^4, 9: 377
nuclear resonance in liquid molecules, 9: 1639(J)
photoproduction in coincidence with neutrons, 9: 2331(R)
polarization, review, 9: 1400(J)
polarization direction measurement of proton spin, 9: 2036(J)
polarization due to elastic scattering of 310-Mev, 9: 7142(J)
polarization in p-p scattering at 170 Mev, 9: 3966(R)
polarization in p-p scattering at reduced energy, 9: 2890(R)
polarization in p-p scattering for P and F waves, formula, 9: 787(J)
polarization of, by proton scattering, 9: 416(J)
polarization of, by scattering from Be, 9: 1110(J)
polarization of, in (d,p) reactions, 9: 1647(J)
polarization of doubly-scattered, 96-Mev, 9: 6055(J)
polarization of high-energy, in elastic scattering on He and C, 9: 789(J)
polarized, slowing down in various attenuators, 9: 2039(J)
positive, negative, and neutral components from solids bombarded with, 9: 2486(J)
produced by B(α,p)C reaction, 9: 5799(J)
production cross sections and angular distribution for, from $\pi^+ + d \rightarrow p + p$ reaction, 9: 424(J)
production of heavy mesons by, of energies 2.2- and 3.0- Bev, in emulsions, 9: 6016(J)
production of negative H ions by, in metal foils, 9: 6789(J)
production of photo-, by O^{16} (γ,p)N^{15} reaction, cr sections and angular distribution of, from photons between 13.5 and 18.7 Mev, 9: 6070(J)
production of photo-, in sulfur, 9: 6054(J)
proton reactions (p,dπ^+) at 510 to 660 Mev, 9: 3606(J), 5452(J)
proton reactions $p + p \rightarrow d + \pi^+$ at 460 Mev, 9: 3605(J), 4287(J), 4571(J)
proton reactions $p + p \rightarrow \pi^+ + d$, angular distribution and total cross section, 9: 5789
proton reactions $p + p \rightarrow \pi^+ + d$, polarization effects in, 9: 4605(J)
proton reactions $p + p \rightarrow \pi + d$ with polarized, 9: 790(J), 7554(J)
proton scattering, angular distributions at 18.3 and 32.0 Mev, 9: 409(J)
proton scattering, phase shift and coulomb interference effects, 9: 6501
range-energy and energy-momentum relations, tables, 9: 402
range-energy relations of, in nuclear emulsion at energies up to 2 Bev, 9: 3939(J)
range of 1- to 7-Mev, in Fe, Cu, Mo, Cd, Sn, Ta, and Pb, 9: 6788(J)
range of 208-Mev, in nuclear emulsions, 9: 3669(J)
reactions of 460-Mev, fission and star formation in Bi and W, 9: 7538(J)
reactions with carbon, nitrogen, and oxygen at 140 Mev, 9: 5800(J)
Protons (cont'd)
reaction with 400-Mev neutrons, $\pi^\pm$ meson production from, 9: 5458(J)
reactions with light and medium weight nuclei, graphs of coulomb functions for, 9: 6502
reactions with H^3, energy levels of α particles from, 9: 741(J)
recoil tracks from stars produced by 50- to 450-Mev, 9: 1569(J)
recoils from neutron bombarded paraffin, derivation of equations, 9: 7170(J)
relaxation times in pure liquids and in liquids containing paramagnetic gases, 9: 5143(J)
resonances in elastic scattering of, on carbon and oxygen, 9: 6059(J)
resonant capture by F^{19} of, at 0.5 to 2.2 Mev, 9: 7129(J)
S and P wave analysis of p-p scattering experiments, 9: 4616(J)
scattered by 300-Mev neutrons, 9: 7517(J)
scattering and Coulomb interference of 113-Mev π^+ mesons by, 9: 1337(J)
scattering by deuterons, 9: 2037(J)
scattering by Mg and Be at 3 to 6 Mev, differential cross sections for, 9: 2944(J)
scattering by neutrons, radiation from, 9: 1376(J)
scattering by neutrons at small angles, 9: 5517
scattering by protons, Coulomb interference effects in, 9: 1663(J)
scattering by protons, determination of transition matrix in, 9: 4308(J)
scattering by protons, differential cross sections at 419 Mev, 9: 5526(J)
scattering by protons, possible triple-scattering experiments for studying, 9: 1660(J)
scattering by protons, rotation of polarization vector and depolarization in, 9: 4607(J)
scattering by protons, vacuum polarization in, 9: 4606(J)
scattering by protons at 240 Mev, phase shift analysis, 9: 5527(J)
scattering cross sections for 5.77-Mev protons, 9: 1394(J)
scattering in oxygen, optical model for, in energy range 9.5 to 14.1 Mev, 9: 6036(J)
scattering of π^- mesons with heavy-particle production, 9: 1666(J)
scattering of 437-Mev, by protons, 9: 776
scattering of 14.1-Mev neutrons by, 9: 2939(J)
scattering of 91-Mev neutrons by, 9: 1392(J)
scattering of 160-Mev mesons by, 9: 1108
scattering (p-p), phase shifts for relativistic corrections in high-energy, 9: 4614(J), 7591(J)
scattering (p-p), relativistic corrections for high-energy, 9: 7590(J)
scattering (p,p) in nuclear emulsions for 425-Mev, 9: 7175(J)
scintillation response of anthracene to low-energy, 9: 7180(J)
spallation-fission of U by 340- to 350-Mev, 9: 4343(J)
spallation of Cu and Bi by 480-Mev, yields and cross sections, 9: 7938(J)
spallation of silver by 480-Mev, cross sections and yields, 9: 7940(J)
spallation produced by 480- and 660-Mev, in Cu, La, and Bi, 9: 7939(J)
stars from 5.7-Bev, 9: 6035(R)
stopping cross sections, 9: 2026
tritium reactions (p,n), 1 to 7 Mev, 9: 6770(J)
wave guide for acceleration of, at 50 Mev, 9: 6499(J)

Protons (negative)
existence in cosmic ray primary flux, 9: 7411(J)
production and annihilation, 9: 1345(J)

Protozoa
(See also Amoeba; Paramecium; etc.)
effects of x radiation on division rate and survival of Tillina and Colpoda, 9: 2584
electron histological study of Euplotes, 9: 4911(R)
radioinduced mutations in, 9: 1716(J)

Psychology
discrimination learning in monkeys with implications for investigation of psychobiological effects of ionizing radiation, 9: 4
memory, effects of radiation on, in monkeys, 9: 478, 479

Psychrometers
(See Hygrometers.)

Pulse analyzers
(See also Oscillographs.)
applications and techniques of, in radiochemistry of heavy elements, 9: 7448
circuit design, 9: 3941(J)
circuits for electronic pulse divider, 9: 2418(J)
design, 9: 1434(P), 5206(R), 8017(P)
design and performance, 9: 3585
design for closely-spaced distributions, 9: 3965(R)
design for γ scintillation spectrometers, 9: 696
design for short-resolving-time, 9: 7056
design of, using electron-beam tube, 9: 6381
design of 100-channel, using delay line storage, 9: 6706
design of 100-channel, using magnetic core storage, 9: 7865(J)
design of 100-channel serial memory, 9: 7866(J)
design of 24-channel portable, 9: 6719(J)
design of 50-channel, 9: 1585(J)
ionization, for resolution of α spectra, 9: 3595(J)
modifications to obtain coded decimal presentation and a decimal print-out, 9: 7864(J)
multichannel recording time-delay, design, 9: 5708(J)
use of glow tube scaler with, 9: 5723
voltage calibration system for, 9: 5406

Pulse columns
countercurrent, development, 9: 5933
design and flooding capacity, statistical analysis, 9: 4747(R), 4748(R)
design and flooding characteristics, 9: 1481
design and performance, 9: 589(J)
design and performance of a louvre-plate redistributor for large-diameter, 9: 588(J)
packed, calculation of pulse amplitude, 9: 3790
performance, 9: 5300(J)
power requirements for pulse generation in, 9: 5301(J)
pressure drop characteristics of liquid flow through a perforated-plate assembly, 9: 4771
sieve plate, flow capacity, effects of pulse and cartridge geometry variables on, 9: 6240

Pulse counters
(See Radiation detection instruments (pulse type); Scalers.)

Pulse generators (electronics)
coaxial mercury relay for, 9: 7433
design, 9: 1020, 7999(P)
design and operation of high-voltage, high-speed wave surge, 9: 5704
design for Bevatron magnet, 9: 6379
design of millimicrosecond, 9: 5206(R)
design of series disc generator, 9: 6377
design using Hg relays, 9: 1946

Pulse generators (hydraulics)
power requirements in liquid-liquid extraction columns, 9: 5301(J)

Pulse integrators
design of portable, low-counting speed, 9: 710(J)
miniature, suitable for airborne conditions, designs for, 9: 6403

Pulse modifiers
circuits for electronic pulse divider, 9: 2418(J)
design of polarity selectors, 9: 5559(P)
in neutron flux measurement systems, 9: 7454(R)
voltage calibration system for, 9: 5406

Pulse transformers
magnetic modulators, design, 9: 7070(R)

Pulses
millimicrosecond techniques, 9: 2349(J)
synthesis of, by networks, 9: 1020
thermal energy, shaping, 9: 5383
voltage, system for measuring amplitudes of, 9: 5406

Pumpkin Buttes Area (Wyo.)
uranium bearing sandstone and coal deposits in, 9: 2263
uranium distribution, geology, mineralogy, and exploration, 9: 627(J)

Pumps
(See also Diffusion pumps; Electromagnetic pumps; Jet pumps; Vacuum pumps.)
testing, 9: 136(R), 5934(R)
testing of high-temperature hydraulic, 9: 2795(R), 3123(R), 4484(R), 6949(R)

Pumps (liquid metal)
(See also Electromagnetic pumps.)
design and performance for liquid-metal heat transfer systems, 9: 691
design and performance of electromagnetic, 9: 3443
design of centrifugal 50 hp, for sodium, 9: 943(J)
GE induction type for Na, testing, 9: 4175(R)
for reactor coolants, tabulation, 9: 7534(J)

Pupae
effects of high-tension oxygen on, of Habrobracon, 9: 1729(J)

Purdue Research Foundation, Lafayette, Ind.
progress reports on fluorine-containing elastomers, 9: 5898(R)
progress reports on nuclear physics research, 9: 7893(R)
progress reports on synchrotron research, 9: 7944(R)

Purine, 6-amino-
(See Adenine.)

Purines
biosynthesis of, by E. coli, tracer study, 9: 2547(R)
metabolism of, in normal and neoplastic tissues, tracer study, 9:6504(J)

Pyrex
(See Borosilicate glass.)

Pyridine
neutralization titrations in anhydrous, 9: 882(J)
reaction with methyl iodide, 9: 2646(J)
reactions with BF_3, 9: 2624(J)

Pyridine complexes
with selenium tetrafluoride, preparation, 9: 2220(J)

3-Pyridinecarboxamide
(See Nicotinamides.)

Pyrites
occurrence in black shales, 9: 1826(R)

Pyrohydrolytic analysis
of fluorides and other halides, design of apparatus for, 9: 3411(J)

Pyrometers
(See also Thermocouples.)
design of, using G-M counters, 9: 1430(P)
dichromatic radiation, design, 9: 3806

2,3-Pyrrolidinediones, 1-(4-nitrophenyl)-5-phenyl-
decarboxylation, 9: 2136(R)

Pyrrolidone, vinyl-
polymerization by γ radiation, 9: 1781(R) 4100

Pyrrolidone, vinyl- polymers
effects of radiation on molecular weight, 9: 4100

Pyruvic acid
biosynthesis and metabolism of, by algae, 9: 4929

Q

Quantum electrodynamics
(See also Field theory.)
asymptotic Green function in, 9: 6815(J)
Compton effect and particle scattering, pseudoscalar theory, 9: 6551(J)
general relationships in, 9: 7600
interaction between free electrons and electromagnetic fields, 9: 7216(J)
multiple photon production treatment with, 9: 5547(J)
point interaction in, 9: 5830(J)
proper-time electron formalism, 9: 3350(J)
renormalization groups in, 9: 7206(J)
theory of electron and positron quantization, 9: 7584(J)
theory of multiple production of elementary particles, 9: 7543(J)

Quantum mechanics
(See also Mathematics; Physics.)
angular momentum in, 9: 2526
applied to studies of the adsorption of gases on the surface of a solid, 9: 3433(J)
coherent scattering of γ rays by K electrons in heavy atoms, 9: 2479(J)
distinctness of states, 9: 7958(J)
fundamentals and theoretical applications, 9: 7970(J)
generalized spin representation, 9: 1417
influence of relativistic terms in meson theory of nuclear forces, 9: 2085(J)
isotopic spin quantum number for light nuclei, validity of, 9: 1689
nonlinear quantum theory of the electron, 9: 1936(J)
of solids, general discussion of theory of, 9: 6553(J)
relativistic quantum theories of interacting particles, 9: 2532
symmetry operations in, 9: 2528
Tamm-Dancoff method in configuration space, 9: 2531
Tamm-Dancoff methods and nuclear forces, 9: 1696(J)
theory of molecular structure of the triatomic hydrogen complex, 9: 5718

Quantum physics
(See Nuclear physics.)

uartz
(See also Sands; Silicon oxides.)
adsorption of dodecylamine acetate and wettability, 9: 1486
adsorption of Na and Cl ions on, 9: 4980
adsorption of Na and Cl on, 9: 3111(R)
absorption spectrum of irradiated fused, 9: 5177(J)
adsorptive properties of, for Na^+, effect of pH, 9: 623(R)
coloration of, induced by γ and reactor irradiation, 9: 4102(J)
diffusion of H_2 in, 9: 5591(J)
effects of pile irradiation on, 9: 4011(J)
flotation with anionic collectors, application of Gouy and Stern concepts of electrical double layer by streaming potential studies to, 9: 3107(J)
fused, radiation-induced color centers in, 9: 4315(J)
grinding of, in vibratory ball mill, 9: 623(R)
isotopic equilibration determination of O in, 9: 3394
photostimulation and coloration of fused, by x or γ radiation, 9: 5178(J)
secondary electrons from, for primary electrons of 20 kev to 1.3 Mev, 9: 5989(J)
three-quantum annihilation of positrons in, 9: 249(J)

Quartz Creek Pegmatite District (Colo.)
geology, 9: 4156(J)

Quartz crystals
paramagnetic resonance of irradiated, 9: 5382(R)

Quartz fibers
drawing, methods and equipment, 9: 1479

8-Quinolinol chelates
fluorimetric analyses of, for Al and Ga, 9: 5269(J)
with thorium, Ce, or La, precipitation, 9: 83(J)
with uranium(VI), absorption spectra, 9: 131(J)
with uranyl ions, spectrophotometric studies, 9: 5630(J)

8-Quinolinol, 5,7-dihalo- chelates
with uranium(VI), absorption spectra, 9: 131(J)

Quinones
formation of, by reversible photooxidation and photoreduction, 9: 865(J)

R

Rabbits
effects of periodic x radiation on, 9: 27(J)
lethal effects of radiation, 9: 2567(J)
lethal radiation dosage determinations for, 9: 5858(J)
life span of blood platelets in, tracer study, 9: 7670(J)
metabolism of Te^{132}–I^{132} mixtures in, 9: 3754(J)
spontaneous tumors in, a literature survey, 9: 2545(J)
tissue distribution of P^{32} and I^{131} in anesthetized and stimulated rabbit, x radiation dosage determinations, made on a phantom, 9: 3(R)

Rabbittites
occurrence in Lucky Strike No. 2, Mine, Emery Co., Utah, 9: 3829

Racah coefficients
general formula of, 9: 7974(J)

Radiation
(See also specific radiations, e.g. Alpha particles and Beta particles; see also such headings as Accelerators; Cosmic radiation; Nuclear particles; Shielding, Thermal radiation.)
from absorbed fission products, pathological effects on plants, 9: 9
acquired resistance to, in mammalian systems, review, 9: 4043
activation of latent Bartonella muris infections in rats by exposure to, 9: 1164(J)
angular correlations of nuclear, extranuclear effects on, 9: 6445(J)
from astatine (At^{211}) and I^{131}, effects on functioning of thyroid gland in rats, 9: 5574(J)
from atomic bombs, pathological effects on residents of Hiroshima and Nagasaki, statistical analysis, 9: 2535
from atomic explosion, effects on skeletal development of exposed fetuses, 9: 6828(J)
attenuation, preparation of plastic and metallic foils for, 9: 7453
automatic isodose recorder for, 9: 4522(J)
biochemical effects of, review in Annual Review of Nuclear Science, 9: 3733(J)
biological and biochemical effects of, mathematical analysis, 9: 7610
biological effects, book, 9: 1719
biological effects of, 9: 7229, 7230
biological effects of, compared with effects of drugs, 9: 3008
biological effects of, factors affecting, 9: 6568(J)
biological effects of ionizing, 9: 4346(J)
cataracts induced by exposure to, 9: 3722, 3723, 3724, 3725
chromosome aberrations produced by exposure to, effect of linear energy transfer, 9: 835(J)
chromosome breakage induced by exposure to, 9: 4356(J)
clinical uses, late pathological effects, 9: 40(J)
comparative effects of α particles, deuterons, and x rays on lens epithelium in rabbits, 9: 7623(J)

Radiation (cont'd)

comparison standards, 9: 1616(J)

contribution of surface dose of ionizing, to tissue doses, 9: 705(J)

data, handbook, 9: 2542(J)

detection, units and instruments used for, review, 9: 704(J)

detection and measurement, manual, 9: 5123(J)

detection and measurement of, kinetic nucleographic method for, 9: 712(J), 714(J)

dosage determinations, application of gelatin phantoms in, 9: 6730(J)

dosage determinations, manual for, 9: 7858(J)

dosage determinations of, based on effects of, rather than quantity of, at a point, 9: 320(J)

dosimetry of, following atomic disaster, performance of photographic roll film from local drugstores for, 9: 698

effects of pile, on barley seed, 9: 3030(J)

effects on bacteriophages, 9: 1160(J), 4350(J)

effects on biological systems, 9: 7622(J)

effects on biosynthesis of ergosterol in yeast cells, 9: 7620(J)

effects on blood platelet production in dogs, 9: 4920(J)

effects on brainstem and hypothalamus in primates, 9: 832(J)

effects on carbohydrates, enzymes, lipids, and proteins, and sterilization of food by exposure to ionizing radiation, review of literature, 9: 2549

effects on enzyme activity, 9: 4674(J)

effects on epidermis respiration, 9: 6569(J)

effects on growth and salt absorption by bulbs, 9: 26(J)

effects on plants, 9: 7618(J)

effects on production of ulcerative colitis lesions in rats, 9: 5849(J)

entropy, 9: 5086(J)

genetic damage produced by, on populations, 9: 5226(J)

genetic effects on man, review, 9: 4923(J)

immediate and late effects of total-body exposure to, on mammals, review, 9: 3368(J)

inactivation of bacteria by exposure to, effects of pretreatments and posttreatments, 9: 3743(J)

inactivation of enzymes induced by exposure to, in intact cells, 9: 4349(J)

induction and therapy of tumors with, 9: 7226(J)

inhaled, effects on hematopoietic system, 9: 6573(J)

integral formulas for initial reduction of transport equation, 9: 4884

from iodine (I^{131}), histopathological effects of large doses of, on thyroid gland of dogs, 9: 1169(J)

ionizing, effects of exposure on incidence of abnormal lymphocytes in mice and rats, 9: 1710

lethal effects, variation with species, 9: 1720

lethal effects on mice, rats, rabbits, dogs, guinea pigs, monkeys, and burros, 9: 2567(J)

lethal effects on vertebrates, review in Annual Review of Nuclear Science, 9: 3734(J)

leukemia induced by exposure to, in mice, 9: 4047(J)

measurement of, concepts of intensity and absorbed dose rate applied to, 9: 706(J)

mixed, from a nuclear explosion, biological effects on Neurospora, 9: 826(J)

mixed, from a nuclear explosion, biological effects of, on Tradescantia, 9: 823(J)

mixed γ and fast neutron, induction of pituitary tumors following exposure to, in mice, 9: 2559(J)

multiple scattering of nuclear, 9: 2029

mutations induced in protozoa by exposure to, 9: 1716(J)

from nuclear explosions and nuclear power, biological effects of, 9: 4921(J)

pathological effects of, on eyes, 9: 4669(J)

permissible dosages from external sources of ionizing, handbook, 9: 1453(J)

Radiation (cont'd)

permissible limits of, and operation, calibration, and maintenance of survey instruments, 9: 6725

pollen lethals following exposure to, in Dentura, 9: 4671(J)

from radioactive colloidal gold, pathological effects following intraperitoneal administration in dogs, 9: 4673(J)

skin lesions produced by, role of peroxides in formation, 9: 5842(J)

sterilization of microörganisms by, 9: 7617(J)

treatment of hemangioma of extremities of infants with, effects on retardation of skeleton growth, 9: 7630(J)

"zipper" scattering chamber for, 9: 2394(J)

Radiation chemistry

(See also Radiochemistry.)

of aqueous ferrous sulfate-cupric sulfate solutions, 9: 2661(J)

of aqueous-organic solutions, 9: 5571

asymmetry of action of H and OH in oxidation-reduction caused by ionizing radiations, 9: 1216(J)

chemical and industrial applications, 9: 579(J)

chemical effects of (d,p), (n,2n), and (γ,n) activation of I, 9: 1782(J)

concepts and practical applications, 9: 5882

decomposition of NH_3 and N_2O, effect of γ and α radiation on, 9: 7715(R)

effects of α particles on aqueous solutions, 9: 580(J)

effects of γ radiation on aqueous solutions of sulfuric acid, 9: 5614(J)

effects of heavy-particle radiation on aqueous solution of acetic acid, 9: 2197

effects of radiation on aqueous solutions of NO_3^-, I^-, Fe^{2+}, and Fe^{3+}, 9: 7718(J)

of hyaluronic acid and hyaluronidases, 9: 2659(J)

inhibitory action of Cl ions on the formation of H_2O_2 by α particles, 9: 581(J)

of olefins and acetylenes, 9: 2662(J)

oxidation of phosphites by α particles, 9: 582(J)

oxidation-reduction reactions, effects of irradiation on, 9: 7719(J)

oxidation-reduction reactions, sensitization and suppression, review, 9: 7307(J)

photochemical decomposition of H_2O, effect of HgS on, 9: 6611(J)

polymerization of acrylamide following exposure to γ radiation, 9: 4950(J)

polymerization of ethylene and chlorination of benzene and toluene under γ radiation, 9: 1550

polymerization of n-vinylpyrrolidone by γ radiation, 9: 1781(R)

preparation of radiation sources utilizing fission products for, 9: 7021

of pure organic compounds, 9: 102

radiolysis of aqueous solutions of KNO_3 and $CuSO_4$, effect of solutes on molecular yields in, 9: 7716(J)

review, 9: 5287, 6221(J), 7721(J)

review of new work and its significance in, 9: 103(J)

of water, yields of H_2O_2, effects of KCl and KBr on, 9: 2660(J)

yield variations with ionization density, studies with cyclotron beams, 9: 2200(J)

Radiation chemistry conferences

on effects of ionizing radiation, 9: 6221(J)

Radiation damage

(See also appropriate subheadings under units, materials, tissues, organs, etc., exposed to radiation; see also Radiation injuries.)

mechanism of irradiation disordering of alloys, 9: 4012(J)

techniques for study of, with cyclotrons, 9: 430(J)

to tissues from internal dose of ThO_2, 9: 5865(J)

Radiation detection instruments

(A complete instrument, not necessarily including the detector component; see also Radiation detectors; Radiological telemetering systems; Rate meters; Scalers.)

automatic radiation isodose recorder, 9: 4522(J)

automatically operated monitoring, design and maintenance, 9: 6400

backscattering of electrons, 9: 684(J)

Radiation detection instruments (cont'd)
British survey of latest, 9: 4251(J)
cadmium sulfide crystal probes for medical radiology, 9: 5434(J)
calibration, design of a γ source for, 9: 3923
calibration of high-range, facility for, 9: 2099(R)
calibration of portable survey radiac, 9: 6405
calorimeter used to measure U^{235} fission fragment energy, 9: 5832(J)
circuits, 9: 2349(J)
commercial and home-built types, general description, 9: 7468(J)
components, failure rates, 9: 1329(J)
conductimetric and colorimetric, performance, 9: 4242(R)
description and availability of, used in England, 9: 296
continuous alpha air monitor, design and theory of, 9: 7856
design and operation, 9: 7872(J)
design and performance, review, 9: 704(J)
design of, concepts of intensity and absorbed dose rate applied to, 9: 706(J)
for detecting α particles, performance, 9: 4048
for detecting defects in metals, design, 9: 7804(J)
for detecting energetic radiations, design and performance, review, 9: 5431(J)
for dosimetry during cycloradiotherapy, 9: 6004(J), 6005(J)
dosimeters for x and γ radiation, development in Soviet Union of, 9: 5428(J)
efficiency of, for detection of α and β particles, 9: 5721(R)
employing a scintillation detector, collimators and scanning device for use with, in localization of internally deposited I^{131}, 9: 6421(J)
features of lectures on, 9: 294
for formation of visual images of ionizing radiations, design, 9: 2868(J)
hodoscope and cloud chamber measurements, comparison, 9: 5130(J)
"hodoscope chamber", development of, 9: 6410(J)
induction electrode applied to proton detection, 9: 5785(J)
manual, 9: 5123(J)
for measurement of alpha surface activity, 9: 6868
for monitoring α and β particles, performance, 9: 4049
nonsaturable charged-foil type, for measurement of high-energy ionizing beams, 9: 3265(J)
operation, 9: 7858(J)
portable, circuit design and performance, 9: 3930(R)
for prospecting and analyzing radioactive minerals, 9: 2431(J)
random dead time, theory, 9: 323(J)
sample changer for automatic radioactivity measurements with, 9: 3602(J)
saturation in, with high intensity x rays, 9: 1604
simplified apparatus for brain tumor surveys, 9: 1975(J)
stabilizing scintillation spectrometers with counting-rate-difference feedback, 9: 7457(J)
summary of information presented at Geneva, 9: 7101(J)
for survey purposes, design, 9: 5731(J)
for survey work, operation, calibration, and maintenance, 9: 6725
thermopiles and ionization chambers, 9: 7070(R)
Radiation detection instruments (colorimetric)
dosimetry by alkali halide crystals, 9: 6733(J)
geometrical corrections in Bragg-Gray relation, 9: 5446(J)
utilizing acrylonitrile on CCl_4–benzene–indicator–sensitizer systems, 9: 2848(R)
Radiation detection instruments (ion current type)
automatic, for plotting isodose curves, 9: 1324(J)
automatic air monitor for tritium contamination, 9: 5430(J)
bismuth-fission ionization chambers, design, 9: 5116
charger for, performance of nuclear batteries as, 9: 2825(R)
Radiation detection instruments (ion current type) (cont'd)
design, performance, and charging, 9: 3587
design and performance of, for gamma measurement in high radiation fields, 9: 3926
design and performance of pocket dosimeter for x and γ radiation with an enclosed self-charger, 9: 1328(J)
for detection and measurement of x radiation, design characteristics, 9: 5437(J)
for direct β measurement, design, 9: 3937
performance of, for detection and measurement of β particles in determinations of the basis weight of fibrous materials, 9: 307(J)
probe type, design of, 9: 299
a small CdS probe of high resolution for use with, design, 9: 1333(J)
Radiation detection instruments (pulse type)
adding circuit for use in cosmic-ray experiments with large Geiger counter hodoscope, 9: 5125(J)
for alpha, β, and γ monitoring of hands, feet, and clothing, design, 9: 3266(J)
alpha floor monitor, design, 9: 302
alpha track counter, 9: 6094
application in x-ray diffractometry of radioactive samples, 9: 4525(J)
application to vapor phase analysis, 9: 2873(J)
automatic sampler and recorder for airborne contaminants, 9: 1325(J)
automatic sample changer, design, 9: 7469(J)
beta counter for low levels, 9: 6413(J)
bromine-quenched and iodine-quenched G-M counters, design, 9: 3259(J)
calibration equipment for pile flux monitors, 9: 298
calibration of BF_3 proportional detector, for fast neutron detection, 9: 5422
circuits, 9: 1319(J)
comparison between LiI scintillation counter and BF_3 proportional counter for use with neutron crystal spectrometer, 9: 4512
containing G-M tubes, performance, 9: 1041
continuous-flow ionization chambers, pressure-regulator for, 9: 5110
for continuous monitoring of laboratory air and surface contamination, 9: 1977(J)
correction factors for comparing activities of C^{14}-labeled compounds, 9: 4853(J)
for cosmic ray measurements, design and performance, 9: 1301(J)
design, 9: 1611(J)
design, calibration, and performance of BF_3 thermal neutron detection channel, 9: 1316
design and characteristics of, 9: 295
design and performance, 9: 802
design and performance of, for counting Kr^{85}, 9: 300
design and performance of, for geologic field use, 9: 702(J)
design and performance of portable fast and slow neutron survey meter, 9: 306
design and performance of Savannah River plant α and γ scintillation counters, 9: 3925
design and performance of scintillation counters for γ rays above 50 Mev, 9: 1053(J)
design of, for assay of bagged radioactive ores, 9: 4516
design of, for C^{14} dating, 9: 3255(J)
design of, for determining tritium in body fluids and aqueous solutions, 9: 5111
design of, for identification of charged particles, 9: 5443(J)
design of, for monitoring air for radon, 9: 4510
design of, for selecting cosmic showers, 9: 3560(J)
design of, for thickness measurements of thin α-active layers, 9: 1236
design of very wide range proportional absorption counting system, 9: 2872(J)
electronic plateau plotter, 9: 6444(R)
employing a proportional detector, performance in measurements of neutron dose as a function of linear energy transfer, 9: 6007(J)

Radiation detection instruments (pulse type) (cont'd)
employing infrared stimulated phosphors, design, 9: 7863(J)
employing scintillation detectors, design and performance, for measurement of β particles from C^{14}, 9: 701
employing an external cathode proportional detector, performance, 9: 1330(J)
evaluation and modification of Raychronix E-1 fast neutron dosimeter, 9: 5425
fast coincidence counting system for high-energy particles, design, 9: 2416
fission counter design, 9: 1971(J)
gamma-ray flux measurements, 9: 4534(J)
G-M well counter for large volume determinations, 9: 7460(J)
geometric efficiency of cylindrical counters, 9: 2427(J)
high-frequency impulse counting, use of wire recorder, 9: 4850(J)
integrating circuit for low count rates, 9: 710(J)
liquid scintillation, for C^{14}, development, 9: 4842(R)
for low-background counting, design, 9: 5108
low-cost mechanical scanner, design, 9: 1323(J)
measurement of protons, deuterons, and α particles from photonuclear reactions, design, 9: 1037
modification of gas mixture in proportional counter for $C^{14}O_2$ analysis, 9: 4857(J)
for monitoring fast neutrons, design, 9: 3934
monitoring of air for β activity, design, 9: 5113
neutron counter using gas scintillation principle, design, 9: 7071
nonoverloading pulse amplifier for, design, 9: 2099(R)
performance and selection of, for routine radiometric analysis for U in ores, 9: 878
performance of, for quantitative determination of γ-emitting elements in living persons, 9: 3591(J)
performance of, in detection and measurement of thermal neutrons, 9: 1036
performance of, in detection and measurement of trace amounts of β activity from C^{14} or S^{35}, 9: 6008(J)
performance of a 4π β counter for scanning paper chromatograms, 9: 3263(J)
performance of Hornyak button as fast neutron dosimeter, 9: 7957
performance of self-quenching, with quenching circuits, 9: 693
portable, design, 9: 5112
portable battery-driven α monitor, design, 9: 3933
portable radon ionization chamber design, 9: 2855
power supply for, use of automobile radios as, 9: 4849
pulse height distribution analysis for low energies, 9: 1605(J)
pulse height distribution from BF_3 proportional counters, 9: 4535(J)
for radiological defense, design, 9: 2415
resolution losses in, 9: 1047(J)
scintillation counter design, 9: 1067(R)
scintillation counters, pulse height variation in, 9: 6415(J)
scintillation detector design for fast γ spectroscopy, 9: 4520(J)
scintillation detector for carborne and airborne use, 9: 1321(J)
self-balancing, for the measurement of ionization ratios, design, 9: 2419(J)
sensitivity, methods for improving, 9: 1046(J)
source-mount absorption corrections in a 4π counting, 9: 4527(J)
stability problem and stabilizing circuit, 9: 2861(J)
threshold of a Geiger-Mueller tube, effects of the semi-proportional region on, 9: 1973(J)
time-lag in Geiger counters, effects of, 9: 2849
transistor high voltage power supply for, 9: 1944
well-type, use in measuring 2 or more radioisotopes in a liquid sample, 9: 2870(J)
x-ray absorption and counting efficiency data, 9: 4524(J)

Radiation detectors
(See also Chemical radiation detectors; Cherenkov detectors; Cloud chambers; Crystal detectors; Fission chambers; Geiger-Mueller tubes; Ionization chambers; Metal-foil detectors; Photoelectric cells; Photographic film detectors; Photomultiplier tubes; Pocket chambers; Proportional detectors; Radiation detection instruments; Scintillation detectors.)
adjustment and comparison criteria, statistics of, 9: 4848
alkali halide crystals, dosimetry of x and γ radiation by, 9: 6733(J)
bubble chamber, principle, construction, and uses of, 9: 6419(J)
bubble chambers, operation and characteristics, 9: 2425(J)
comparison of sensitivities of, for C^{14}, 9: 6513(J)
copper BF_3 counter, development of, 9: 6751(R)
design and theory, 9: 7859(J)
design of, for neutrons, 9: 8015(P)
design of neutron-sensitive ionization chambers, 9: 8016(P)
dosimeters for x and γ radiation, development in Soviet Union of, 9: 5428(J)
large nuclear-emulsion block, construction of, 9: 1049(J)
for measuring α particle range and straggling in liquids, 9: 4536(J)
melamine, use as x-ray detector, 9: 5127(J)
multiple scattering correction for, 9: 1117(J)
nuclear-emulsion embedded wires for use as, 9: 1052(J)
phantom measurements in thyroid studies, use in, 9: 1737(J)
photographic film, for use as emergency dosimeter, 9: 6412(J)
plastic uses in preparing, 9: 2387(J)
radiation balance for colorimetric comparison of radium standards, 9: 1050(J)
random dead time, theory, 9: 323(J)
silver-activated phosphate glass for mapping gamma ray fields, 9: 3261(J)
thermopile, sonic flux modulator, and acoustic ionization detector for neutrons, 9: 7454(R)

Radiation effects
(See also appropriate subheadings under specific materials and organisms.)
on bacteria, nutritional aspects of, 9: 6831(J)
biochemical processes taking place in organisms due to penetrating radiations, 9: 7615(J)
biological, bibliography on, 9: 1720
biological and chemical, book, 9: 6833(J)
changes in materials produced by, 9: 7183(J)
chemical, in solids, survey of published work on, 9: 6614(J)
chemical and industrial applications, 9: 579(J)
cobalt Co^{60} γ, on cellular lethality of Crepis Zacintha L. Babc., 9: 6158(J)
disordering of solids by neutrons, theory, 9: 4014(J)
genetic, from nuclear explosion products, 9: 6157(J)
on graphite at low temperatures, 9: 5611(J)
of heavy particles on the ferrous sulfate–lithium sulfate system, 9: 6106(J)
indirect, on dogs maintained on diet of meat from lethally irradiated animals, 9: 5227(J)
of intravenous injection of Pu^{239} and Ra^{226} in dogs, 9: 6843(J)
in ionization, role of "subexcitation electron" in, 9: 2819(J)
of ionizing radiation on mutations, 9: 490(J)
on materials, bibliographies, 9: 6186
of 2-Mev electrons on dioxyribonucleic acid (DNA), 9: 7247(J)
of 2-Mev electrons on pneumococcal transforming factors, 9: 7247(J)
optical bleaching of F centers in x-rayed alkali halide crystals, 9: 6692(J)

Radiation effects (cont'd)
on plastics and elastomers, 9: 7569(J)
on polymerization of plastics, 9: 1785(J)
in solids, chemical, 9: 6108(J)
thermal spikes, experimental evidence for, 9: 5813(J)
on various materials, summary of research, 9: 6288
of x and β rays on rabbit's ears, 9: 6844(J)
x-ray analysis of, 9: 2496
Radiation exposure chambers
automatic, design, 9: 7306
with controlled atmosphere, design, 9: 480(R)
for CP-5 reactor, design, 9: 4911(R)
design and calibration of a 100 curie, using Co^{60}, 9: 3896(J)
employing radiocobalt γ source, for large animal irradiation, design, 9: 5680
rat irradiation, dosimetric study of experimental facility for, 9: 2099(R)
Radiation injuries
(See also appropriate subheadings under organisms, organs, and Radiation and specific radiations; see also Radiation damage; Radiation sickness.)
in animals, mechanism of development, 9: 7612(J)
from atomic explosions, effects on residents of Hiroshima and Nagasaki, summary, 9: 3745(J)
of barley seed, effects of CO_2, O and low temperature on, 9: 2593(J)
biological effectiveness of high and low intensity x radiation on Drosophila, 9: 3029(J)
chemical prophylaxis with cholinergic drugs and mercurial diuretics, and effects of temperature on in rats, 9: 2548(R)
chemical prophylaxis with thiourea derivatives and 2,4-dinitrophenol, negative results in mice, 9: 480(R)
of chromosomes, effects of pre- and post-irradiation centrifugation, 9: 842(J)
of connective tissues in rats, 9: 492(J)
delayed, from clinical use of Ra chlorides and Th oxides and from ingestion of Ra and Th isotopes, 9: 40(J)
correlation with blood plasma level of injected I^{131}, in rats, 9: 6824
correlation with urinary desoxyribonucleases in rats, 9: 23(J)
correlation with weight loss in mice, 9: 477
effects of altitude on, in rats, 9: 6154(R)
effects of bio-flavonoid therapy on, in cancer patients, 9: 839(J)
effects of blood pressure on recovery from, in chicks, 9: 7627(J)
effects of cortisone on, in adrenalectomized and non-treated mice, 9: 838(J)
effects of cysteine on, in Drosophila, 9: 3371(J)
effects of environmental temperature and barometric pressure at various altitudes on survival of x irradiated rats, 9: 4665
effects of granulocyte count and litter on survival following, in mice, 9: 39(J)
effects of growth hormone on, in rats, 9: 5864(J)
effects of increased environmental temperature on, in rats, 9: 480(R)
effects of injected adenosinetriphosphate on, in rabbits, 9: 5239(J)
effects of injected bone marrow on, in mice, 9: 2597(J)
effects of injected pituitary growth hormone on, in mice, 9: 1721(J)
effects of injection of inorganic particulate matter on, in mice, 9: 7640(J)
effects of oxygen and peroxide on, in Paramecium, 9: 4672(J)
effects of premedication with chlorpromazine on, in mice, 9: 3747(J)
effects of prophylactic and therapeutic doses of cortisone on, in rats, 9: 2591
effects of thorazine and phenergan on, in mice and rats, 9: 4911(R)
of eggs of Habrobracon, effects of oxygen on, 9: 2592(J)
of eyes, produced by atomic flash, 9: 3026(J)
following application of Ra^{224} to skin, 9: 4688(J)
Radiation injuries (cont'd)
of hematopoietic cells of tadpoles, effects of anoxia on, 9: 1448(J)
of hematopoietic system in dogs and rats, 9: 3739(J)
of hematopoietic tissues, protective effects of p-aminopropiophenone, cysteine, and mercaptoethylamine against, in rats, 9: 6580(J)
induced by single and divided radiation doses in rats, a comparison, 9: 5857(J)
induction of cataracts by exposure to β particles of man and rabbits, 9: 2118(J)
of intestine, bacterial infection following, in mice, 9: 2553(J)
from ionizing radiation, 9: 4346(J)
late, following exposure of eye to β particles, 9: 4347(J)
leukemia incidence among atomic bomb survivors in Hiroshima, 9: 2586(J)
mechanisms of, mathematical analysis, 9: 7610
method of fitting the multi-hit survival curve, 9: 4911(R)
of mice, effects of injections of rat bone marrow administered with and without cortisone, 9: 4051
to personnel unavoidably exposed to high levels of radiation, criteria for evaluation of, 9: 7251(J)
to populations, factors affecting, 9: 7248(J)
prophylactic effects of cysteamine against, in mice, 9: 2121(J)
prophylactic effects of organic sulfur-containing compounds, adrenergic blocking agents, and purine and pyrimidine derivatives on, in mice and rats, 9: 6154(R)
prophylaxis of, with blood serum and plasma proteins in mice, 9: 3(R)
protection against, in adult mice by bone marrow grafts, 9: 841(J)
protection against lethal effects, a survey of effects of over 100 substances on in vivo and in vitro systems, 9: 5237(J)
protection of guinea pigs to x radiation by chemical reduction of metabolism, 9: 43
protective action of various substances against, to mice, 9: 7637(J)
protective effects of blood proteins against, in mice, 9: 2598(J)
protective effects of chlorpromazine, analgesics, and methyl bis(2-chloroethyl)-amine hydrochloride against, in mice and rats, 9: 4665
protective effects of CO, KCN, and H_2S, 9: 2599(J)
protective effects of cysteine against, 9: 3035(J)
protective effect of cysteine against, effects of high oxygen tension on, in rats, 9: 4667
protective effects of cysteamine and β-mercaptoethanol against, in E. coli, 9: 4678(J)
protective effects of cysteine, mechanism, 9: 2601(J)
protective effects of folic acid and vitamin B_{12} against, in guinea pigs, 9: 6583(J)
protective effects of granulocytes in, 9: 1720
protective effects of homogenates of bone marrow or spleen against, in mice. 9: 2596(J)
protective effects of injected spleen and bone marrow homogenates against, in mice, 9: 3370
protective effects of inorganic Mg against, in Hydra, 9: 41(J)
protective effects of Mg to x radiation, in mice, 9: 6846(J)
protective effects of phenolic and naphtholic derivatives, glucosamine, and liver homogenates against, in mice and rats, 9: 2595(J)
protective effects of s,β-aminoethylisothiuronium-Br·HBr against, in mice, 9: 5582(J)
protective effects of spleen homogenates against, effects of storage on, in mice, 9: 2594(J)
protective effects of spleen homogenates against, in mice, 9: 2600(J)
protective effects of thiourea and thyroxine against x radiation in mice, 9: 3034(J)
reactor exposure cases, 9: 6819(J)
recovery from, role of spleen in mice, 9: 7626(J)
relationship to blood plasma lipid levels in rabbits, 9: 25(J)

Radiation injuries (cont'd)
of skin, detection by inflammatory response, 9: 830(J)
statistical studies of, in mice, effect of environmental factors, 9: 6158(J)
of survivors of atomic explosion in Hiroshima, effects of distance, 9: 3366(J)
syndrome, in germ-free rats, 9: 2546
theory of, 9: 7229
theory of constant, 9: 7230
therapeutic effects of spleen and bone marrow on, 9: 837(J)
therapeutic effects of spleen homogenates against, in mice, 9: 38(J)
therapy in mice using d-1-α-octadecylglycerolether, 9: 1454(J)
therapy of radioinduced leukopenia with alkoxyglycerols, 9: 1455(J)
therapy with beef embryo extract, in mice, 9: 37
therapy with heterologous spleen extracts, negative results, 9: 3033
therapy with injections of bone marrow, 9: 18
from thermal neutrons, in mice, 9: 20(J)
of thyroid gland of rats, effects of hypophysectomy and thyroxine, 9: 2113(J)

Radiation Lab., Univ. of Calif., Berkeley
(See California. Univ., Berkeley. Radiation Lab.)

Radiation monitoring
(The monitoring of radioactivity in work areas, etc.; for monitoring of personnel see also Radiation protection.)
of alpha radiation, performance of instruments, 9: 3268(J)
design and theory of a continuous alpha air monitor, 9: 7856
of floors, performance of a portable survey meter for, 9: 1315
handbook, 9: 3928
of hands, feet, and clothing for β, α, and γ contamination, design of a single unit for, 9: 3266(J)
instrument maintenance, 9: 6400
for iodine (I^{131}) in stack effluent, instrument design, 9: 7854
scintillation counter for atmospheric, 9: 1045(J)

Radiation phantoms
(See Phantoms.)

Radiation protection
(General aspects of the problem concerning personnel; see also Health physics; Radiation detection instruments; Remote-control equipment; Shielding.)
administrative problems in, on federal, state, local, and industry levels, 9: 840(J)
against betatron-synchrotron radiations up to 100 Mev, handbook, 9: 4924(J)
against radiations from Ra, Co^{60} and Cs^{137}, handbook, 9: 1452(J)
anthology of data, 9: 3746
bibliographies, 9: 6185
for cobalt Co^{60} beam therapy installation, 9: 2129(J)
during diagnostic radiology, 9: 3372(J)
film and counter techniques, 9: 42(J)
film badge dosimeter for determining various exposures, 9: 6724
at Hanford, review, 9: 1722(J)
during industrial radiography with radioisotopes, 9: 2589
in laboratories handling α and β particles, 9: 4049
manual for handling radioisotopes, 9: 7639(J)
materials for, of animal organisms, 9: 7637(J)
mechanism of action of over 100 substances in both in vivo and in vitro systems, 9: 5237(J)
permissible limits of radioactive materials, validity of "critical organ" concept for, 9: 5863
of personnel performing autopsies on radioactive cadavers, 9: 44(J)
portable shielding materials, survey, 9: 4637(J)
in a radiochemistry laboratory, 9: 576(J)
for radiographic rooms, 9: 2047(J)

Radiation protection (cont'd)
in radiotherapy employing radioisotopes, 9: 6582(J)
the role of education in, 9: 2122(J)
safety measures in handling radioisotopes, manual, 9: 7638(J)
sanitary regulations in laboratories using Co^{60}, 9: 7643(J)
shield wall stabilization, 9: 3345
during therapeutic radiology, 9: 3373(J)
of x-ray spectroscopists, 9: 5235(J)

Radiation Research Corp., West Palm Beach, Fla.
progress reports on radioactive dosimeter charger, 9: 2825(R)

Radiation sickness
(See also Radiation injuries.)
clinical effects of cysteinamine in, 9: 5234(J)
etiology of, effects of dose received by radiosensitive organs and tissues, 9: 3018(J)
in man following administration of I^{131}, 9: 5854(J)
pathology of, caused by fall-out from thermonuclear explosion, 9: 5861(J), 5866, 5867(J), 5868(J)
prophylaxis and therapy of, using β-mercaptoethylamine, 9: 3036(J)
prothrombin levels associated with, effects of blood platelets, 9: 3313
therapy of, with corticotropin, 9: 2123(J)

Radiation sources
(See also specific sources, e.g., Neutron sources; see also Radioapplicators.)
absorption corrections for mounted, in 4π counting, 9: 4527(J)
calibration, 9: 6725
calibration of the NBS Ra–Be neutron standard, 9: 7498(J)
cooling fuel elements as, design and cost factors, 9: 6507(R)
correcting for bremsstrahlung and scatter in, 9: 7572(J)
in cylindrical containers, surface dosage rates, 9: 3212
design and fabrication of Y^{90}-fused clay spheres, 9: 7060
inelastic β-e^- diffusion effects in, 9: 2040(J)
iodine (I^{132}), design and handling, 9: 7984(P)
light spectra from, 9: 7184
mathematical analysis of flux emission from cylindrical, 9: 779
portable, remote-controlled radiographic Ir^{192}, 9: 3901(J)
preparation and certification of standards for β and β-γ emitters, 9: 4019(J)
radiation field striking round target from, calculation, 9: 5528(J)
shielding design, 9: 3345
from spent MTR fuel rods, cost factors, 9: 3122
standard roentgen source, modification of commercial X-ray unit for, 9: 6095
standards produced by the National Bureau of Standards, 9: 2513(J)
for testing structural materials and chemical systems over a wide temperature range, design, 9: 4621(J)

Radiation target cans
opening, remote-control equipment for, 9: 661(J)
procedure for opening and handling, 9: 564(J)

Radiation target theory
applied to radioinduced inactivation of infectivity and hemagglutination properties of influenza virus, 9: 2106

Radiation targets
backscattering from Mg, C, Be, and Li, bombarded by 1- and 2-Mev electrons, 9: 2041(J)
liquid H, D, and He, for use with high-energy accelerators, 9: 2469(J)
preparation of thin C and O, on Ni foils heated with focused light from 1000-w electric lamp, 9: 242(J)
radiation field striking, from round source, calculation, 9: 5528(J)
styrofoam hydrogen, having a liquid N heat shield, design, 9: 654

Radicals
(See also Free radicals.)
pair from molecular dissociation, kinetics of competitive processes in recombination of, 9: 4371(J)
trapped in rigid solvents, 9: 5612(J)
Radioactive contamination
(See also appropriate subheadings under materials and units contaminated; see also Decontamination; Stack disposal; Waste disposal.)
in leaks, 9: 6678(R)
maximum permissible levels for, of surfaces, 9: 6804(J)
from slab of contaminating material, mathematical analysis, 9: 3935
of soil, fate of, 9: 7283(J)
Radioactive materials
apparatus and techniques for safe handling of, 9: 4829(J)
catalog of, 9: 246(J)
design and function of a general-purpose overhead manipulator for, 9: 606(J)
effects on crop yields, 9: 7619(J)
liquid, sampler for, design, 9: 1424(P)
permissible limits, validity of "critical organ" concept for, 9: 5863
safe handling, 9: 4098(J)
sample changer for automatic radioactivity measurements on, 9: 3602(J)
spectrographic analysis of, 9: 6898
trapping of splashes from boiling, design of apparatus for, 9: 1779
x-ray diffractometer for, 9: 5710(J)
x-ray diffractometry, 9: 4525(J)
Radioactive minerals
(See also specific radioactive minerals, e.g., Pitchblendes; see also ores of radioactive minerals, e.g. Uranium ores.)
tagged, radiometric analysis, assay unit for, 9: 4516
bibliography on, 9: 2272(J)
instruments used in prospecting and analyzing, 9: 2431(J)
prospecting for, by nuclear methods, book, 9: 2715(J)
surface radioactivity detection by photographic plates, 9: 2707
variations in isotopic abundances on Ne and A extracted from, 9: 626(J)
Radioactive minerals (Alaska)
occurrence in southeastern Alaska, 9: 6967(J)
Radioactive minerals (N.C.)
prospecting for, 9: 5323
Radioactivity
(See also appropriate subheadings under specific isotopes, elements, and radiations; see also Induced radioactivity.)
age estimation by, errors in, 9: 6965(J)
in air and rain, following atomic explosions, 9: 6116(J)
alpha emission, generalization of Bateman-Poisson law for, 9: 7195(J)
aspects in geology and cosmology, 9: 2265(J)
atmospheric, natural and artificial, 9: 6526(J)
of biological samples, radioassay procedures, 9: 5862(J)
buildup in nonequilibrium conditions, graphs for, 9: 443(J)
capture-positron branching ratios, theory, 9: 1674
computation of growth of decay products, 9: 2054
concept of parentage of nuclear states in, 9: 3645(J)
discovery of artificial, history of, 9: 1401(J)
disintegration rates by 4π counting, 9: 3603(J)
geological applications, general discussion, 9: 5950(J)
half-life distribution table, 9: 7570
induced by thermal neutrons, tables for simplifying calculations of formation and decay, 9: 2514(J)
Radioactivity (cont'd)
isotopic spin selection rule for electric dipole transitions, 9: 4325(J)
matrix elements in, 9: 1423(J)
matrix elements in superallowed transitions, 9: 2997(J)
measurement with x-ray films, 9: 2432(J)
natural, effect on thermal regime of earth, 9: 2796(J)
natural, of man, contribution of K^{40} and Ra to, 9: 444(J)
natural, search for new and extinct, 9: 953(J)
occurrence in granites, limestones, bentonites, building materials, ground waters, and plants, 9: 445(J)
in rain water in Tokyo, 9: 6848(J)
review of recent studies, 9: 3631(J)
scaler for measurement of half lives in range 3 sec to 30 min, 9: 2420(J)
study by cinenucleography, 9: 7955(J)
study by cinenucleography, application to RaC′, 9: 6115(J)
Radioapplicators
(See also Radiation sources.)
containing cobalt (Co^{60}), effectiveness, as a substitute for Ra as a β radiotherapy source, 9: 843(J)
containing cobalt (Co^{60}), for treatment of cervical carcinoma, design, 9: 4053(J)
containing strontium (Sr^{90}), design, 9: 6590(J)
Radioautography
application of, to study of volume and grain boundary diffusion in metals, 9: 7360(J)
detection of radioactive aerosols by, 9: 7408
increased sensitivity of α-particle photographic detection, 9: 7458(J)
measurement of relative radioactivity, 9: 2432(J)
micro-, technique for metal specimens, 9: 5440(J)
α-particle, with liquid emulsions, 9: 7252(J)
preparation of samples of undecalcified bone, 9: 2547(R)
quantitative β-track, of single cells, 9: 1734(J)
review, 9: 5862(J)
theory, techniques, and bibliography, 9: 5870(J)
of thyroid gland following administration of At^{211} or I^{131}, 9: 5571
of thyroid gland following administration of I^{131}, in mice, 9: 1178(J)
Radiobiology
apparatus giving α-particle microbeam for irradiation of living cells, 9: 2397(J)
book on, 9: 1719(J)
fundamentals of, book on, 9: 6833(J)
intussusception in pericarp of spring rye, x-ray and Ra effects, 9: 2583(J)
scintillation counters in, review, 9: 1035
of ultraviolet radiation, book, 9: 4046(J)
vertebrate, lethal effects, review in Annual Review of Nuclear Science, 9: 3734(J)
Radiochemical processing plants
Oak Ridge metal recovery plant, general discussion of, 9: 6233(J)
Radiochemistry
application of, in industry, conference, 9: 3807(J)
concepts and practical applications, 9: 5882
equipment, 9: 576(J)
equipment for remote chemical separations, 9: 570(J), 571(J)
fundamentals and research applications, 9: 7091(J)
organic materials suitable for use in, 9: 107
Radiodiagnosis
(See also radioisotopes used or conditions studied, e.g., Brain tumors.)

Radiodiagnosis (cont'd)
influence of liver diseases on thyroid-uptake of I^{131}, 9: 499(J)
of thyroid conditions by early differential uptake and renal excretion of I^{131}, 9: 1463(J), 1464(J)
of thyroid diseases, by uptake of I^{131} following administration of desiccated thyroid, 9: 507(J)
Radiography
(See also specific devices or material studied; see also Accelerators and specific accelerators, radioisotopes, and radiation sources.)
application to oil storage problems, 9: 1819(J)
automatic exposure controller for use during, design, 9: 1456
with beta-emitting isotopes, 9: 4679
calibration of diagnostic x rays for use in, 9: 3374(J)
cobalt (Co^{60}) uses in, 9: 7749(J)
dosage to walls during, 9: 2047(J)
equipment and procedures, manual, 9: 7809(J)
evaluation of xeroradiography, 9: 3816
fast, self-developing film for, 9: 2099(R)
feasibility of using a compact unit operating at four million volts, 9: 1368
gamma, in oil storage installations, health and safety precautions, 9: 4776(J)
gamma, inspection of pipeline welds by, 9: 4136(J)
gamma and x-, relative merits of, 9: 3817(J)
industrial, evaluation of Polaroid Radiographic Packet No. 1001, 9: 143
industrial, with radioisotopes, radiation safety, 9: 2589
principles, equipment, and potentialities of xeroradiography, 9: 1171(J)
quality control of metals by γ, 9: 7808(J)
routine, radiation dose to gonads during, 9: 5869
scintillation crystal-TV device for, with 50-Mev x rays, 9: 6255(J)
as service performed by hot lab, 9: 610(J)
Radioisotopes
(See also specific isotopes; see also Fission products.)
angular correlation measurement techniques, 9: 2901(J)
application in research in metals and metallurgy, 9: 7819(J)
application to the study of purity of vapor used in semi-industrial high pressure boilers, 9: 6256(J)
application to measurement techniques, review, 9: 1334(J)
applications, an eight-year summary of, 9: 7062(J)
applications in industry and engineering, 9: 611(J)
application in machine wear estimation, 9: 7750(J)
applications in medicine, 9: 7647(J)
applications in medicine, Hamburg conference on, 9: 7648(J)
applications in medicine and biology, 9: 7608(J)
applications in tracing, gaging, and medical studies, summary of Geneva papers, 9: 7219(J)
applications in tracing sewage flow, 9: 613(J)
buildup and decay factors, nomogram, 9: 4021(J)
catalog of, 9: 246(J)
compounds labeled with C^{14}, bibliography, 9: 1488
conference on medical and physiological applications, 9: 3719(J)
determination of, by measurement of time intervals between disintegration, 9: 1128(J)
determination of, by the distribution of intervals between disintegration, 9: 2966(J)
enrichment by thermal diffusion, 9: 4505(J)
general discussion of properties, uses, separation, shielding, and availability of, 9: 6389(J)
Radioisotopes (cont'd)
growth of decay products, computation of, 9: 2054
half life for low activities of short-lived, calculation, 9: 4022(J)
half life measurements, 9: 2960(J)
half lives, determinations on small samples, 9: 4331(J)
handling, manual for, 9: 7638(J)
handling, safety instructions and regulations for, 9: 7639(J)
handling in chemical laboratories, manual, 9: 7960(J)
handling of, used with animals and plants, 9: 5862(J)
industrial applications, conference, 9: 3807(J)
industrial applications of, 9: 612(J)
industrial radiography with, radiation safety, 9: 2589
ionization by, and industrial uses, 9: 3208(R)
localization of brain tumors by, 9: 6584(R)
medical and industrial uses, bibliographies, 9: 6185
of medical interest, preparation and tissue distribution, 9: 1725(J)
medical uses, radiation protection in, 9: 6582(J)
preparation and applications of, general review of, 9: 6388(J)
produced by a synchrocyclotron, study of, 9: 768(J)
produced by (n,γ) reactions, separation by recoil nuclei method, 9: 180
produced by thermal neutrons, tables for simplifying calculations of formation and decay of, 9: 2514(J)
production, costs, applications, and handling of, general review of Spanish program, 9: 5996(J)
production and isolation of carrier-free, review, 9: 7439(J)
production and physical properties, review, 9: 5712(J)
production of, at ORNL during 1954, 9: 4504(R)
production rates in cyclotron, 9: 3245(J)
properties, decay schemes, and methods of production, 9: 7850(J)
properties, production, and research applications, 9: 7849(J)
properties and industrial applications, 9: 7898(J)
scintillation counting of mixtures of, 9: 2870(J)
short lived, production in low-power reactor, 9: 1953(J)
spectrographic determination in radioactive solutions, 9: 6898
standards for US production, 9: 1311(J)
table of total β disintegration energies, 9: 805(J)
therapeutic and tracer applications in cancer, 9: 4926(J); 4927(J)
therapeutic uses in clinics and research, lectures on, 9: 6168(J)
as tracers in biological research, manual for, 9: 510(J)
Radiological defense
(See also Civilian defense.)
safety and lethal effects of atomic explosions, 9: 469(J)
Radiological Lab., Univ. of Calif., San Francisco. School of Medicine
(See California. Univ., San Francisco. School of Medicine. Radiological Lab.)
Radiological telemetering systems
for monitoring atmospheric radioactivity, design, 9: 1966
Radiology
diagnostic, radiation protection problems, review, 9: 3372(J)
handbook, 9: 2542(J)
therapeutic, radiation protection problems, review, 9: 3373(J)
workers in the field of, congential malformations in offspring of, a statistical analysis, 9: 3025(J)
Radiolysis
application of γ spectroscopy to, 9: 874(J)
Radiometric analysis
(See Radiation chemistry.)

Radiometric analysis (cont'd)
equipment for determination of U in U ores, 9: 878
fiducial limits for net activity, 9: 1034
of gases, techniques and equipment, 9: 300
neutron activation, for determination of barium and strontium in biological materials, 9: 6203(J)
neutron-activation analysis of Na in Al alloys, 9: 1204(J)
of papergrams in determinations of radiochemical purity, 9: 3262(J)
preparation of samples containing α and soft-β emitters dissolved in salt solution, 9: 3730(R)
procedures for separation and decontamination of fission mixtures, 9: 2634
pulse analysis techniques in, 9: 7448
radiochemical purity by Al absorption curves, 9: 4244
sample preparation using small amounts of carrier, 9: 2676(J)
techniques, general review, 9: 5862(J)

Radiosensitivity
(See also appropriate subheadings under specific organs, organisms, and materials.)
of Ascaris eggs, effects of cold treatment on, 9: 4911(R)
of bacteria, factors affecting, 9: 5843(J)
of biological materials, factors affecting, 9: 6568(J)
of cysteine-treated rats, effects of high oxygen tension on, 9: 4667
of developing Artemia, effects of hydration, 9: 3741(J)
of dividing cells, effects of porphyrins on, in paramecium, 9: 6847(J)
of frogs, effects of temperature on, 9: 6820(R)
of malignant tumors, 9: 3017(J)
of mammalian cells, 9: 3015(J)
of mammalian systems, factors influencing, review, 9: 4043
of mice, effects of estrous cycle on, 9: 4675(J)
of pertussis-vaccinated mice, 9: 4670(J)
of rats, effects of polycythemia on, 9: 7243(J)
of rats, effects of removal of pituitary gland on, 9: 5238(J)
of Saccharomyces, influence of anoxia on, 9: 7232(R)
of somatic cells, factors affecting, 9: 821(J)
tolerance to anoxia following total-body exposure to x radiation in guinea pigs, variations with altitude, 9: 2110
of Tradescantia chromosomes, effect of O tension on, 9: 5859(J)
of tumors, effects of vitamin C-free diet on, in laboratory animals and man, 9: 3043(J)
of tumors, factors affecting, 9: 6589(J)
of yeast, effects of nutritional factors on, 9: 3364

Radiotherapy
(See also appropriate subheadings under specific radiations, isotopes, equipment, and conditions treated.)
application of Au^{198} colloids in brine for, 9: 6591(J)
applications of radioisotopes in, of blood disorders, review, 9: 5587
of ascites associated with endothelioma, using colloidal Au^{198}, 9: 4682(J)
of axillary metastases from breast cancer using Au^{198} colloids, 9: 7652(J)
beta dosage determinations for rubber beads containing Sr^{90}/Y^{90} used in, 9: 6587(J)
with betatron-produced high-energy x rays and electron beams, 9: 1724(J)
blood-drop determination of Au^{198} in prostate, 9: 3750(J)
of brain neoplasms by boron-disintegration therapy, in mice, 9: 7227(J)
of brain tumors, with implants of radioactive gold particles, 9: 2127(J)
of brain tumors employing neutron-capture by B^{10}, pathological effects, 9: 4683(J)
of bronchial carcinoma using Co^{60}, 9: 1163(J)

Radiotherapy (cont'd)
of cancer, applications of radioisotopes, 9: 4926(J), 4927(J)
of cancer, research studies, 9: 7253(R)
of cancer of bladder, using balloons filled with Co^{60} solutions, 9: 7651(J)
of carcinoma of cervix uteri, using a combination of Au^{198} and radium, dosimetry, 9: 5872(J)
of carcinoma of ovaries, pleura, and peritoneum using Au^{198}, 9: 1162(J)
case history of leukemia in a patient with thyroid carcinoma treated with I^{131} and x radiation, 9: 3019(J)
of cervical carcinomas, Co^{60} applicator, design, 9: 4053(J)
of cervical carcinomas using Co^{60}, dosimetry, 9: 4052(J)
cobalt (Co^{60}) as a substitute for Ra, 9: 843(J)
cobalt (Co^{60}) teletherapy unit for, 9: 497(J)
with colloidal Au^{198}, optimum sites of injection and lymph node concentration, 9: 1457(J)
conditioning of patients prior to, 9: 5240(J)
conference on new techniques, 9: 3719(J)
in control of uterine bleeding, 9: 6587(J)
conversion of a radium beam unit for housing for a Co^{60} unit for therapeutic uses, 9: 2125(J), 2126(J)
cyclo-, dose measuring instrument for, 9: 6004(J), 6005(J)
design problems in devices for, 9: 6849
dosage determinations during, 9: 6852(J), 6853(J)
of effusions associated with carcinomas, using colloidal Au^{198}, 9: 1175(J)
of effusions due to carcinomatosis, using Au^{198} colloids, 9: 7649(J)
of effusions due to carcinomatosis using radioactive chromic phosphate, 9: 7650(J)
electron filter for a Co^{60} γ beam, 9: 3040(J)
employing internally administered β sources, radiation dosimetry, 9: 498(J)
employing radioisotopes, protective measures, 9: 6582(J)
equipment for infusion of colloidal radiogold, 9: 2604(J)
fundamentals and techniques, book, 9: 4686(J)
gamma dosage determinations for Co^{60} beads used in, 9: 6586(J)
integral dose measurements on a Co^{60} teletherapy beam, 9: 1979(J)
intracavitary application of Co^{60} beads in suspension, 9: 6167(J)
with iodine (I^{131}), calculation of blood radiation dose, 9: 1173(J)
with iodine (I^{131}), radiation sickness in man following, 9: 5854(J)
an isotope survey couch, design, 9: 2128(J)
localization and focusing of betatron beams, 9: 6588(J)
localized, of lesions of pituitary, technique, 9: 4925(J)
of malignant epibulbar melanoma, with Sr^{90} or x radiation, 9: 5244(J)
of malignant tumors, factors affecting tumor radiosensitivity, 9: 6589(J)
of malignant tumors, review, 9: 3044(J)
medical application of Co^{60} in various diseases, 9: 7644(J)
optical systems for adjustment of the skin distance for in vivo measurements following administration of radioisotopes, 9: 688(J)
performance of 8-Mev linear accelerator for, 9: 4684(J)
of pituitary dysfunctions, influence of irradiation of hypothalamus on, 9: 833(J)
preparation and tissue distribution of radioisotopes for use in, 9: 1725(J)
preparation of phantoms for planning, 9: 1727(J)
with radium chlorides and Th dioxide, late pathological effects, 9: 40(J)
rotating telecobalt unit for, dose distribution and protection requirements, 9: 1726(J)
scattered radiation from a Co^{60} beam therapy unit, 9: 2129(J)
skin cancers following, 9: 32(J)
of skin tumors using x radiation, effects of inhalation of oxygen on, 9: 2124(J)
slide rule nomograms for Co^{60}, 9: 3042(J)

Radiotherapy (cont'd)
telecurie, with cobalt, general discussion of all phases of, 9: 5871(J)
of thyroid and thyroid carcinoma, effect of I^{131} on, 9: 5855(J)
of thyroid cancer with I^{131}, γ isodose measurements over entire body, 9: 2605(J)
of thyroid carcinomas, uptake of I^{131} in, 9: 500(J)
of thyroid carcinoma using I^{131}, a review, 9: 5241(J)
of thyroid diseases, uptake of I^{131} in, counting method, 9: 46(J)
of thyroid diseases with I^{131}, prediction of uptake based on uptake of tracer dose, 9: 45(J)
of thyroid diseases using I^{131}, relationship between clinical response and distribution of I^{131} in thyroid and blood serum components, 9: 1460(J)
tissue distribution of colloids of Au^{198}, P^{32} and Y^{90}, 9: 1459(J)
treatment of carcinoma of the prostate with Au^{198}, 9: 4680(J)
treatment of multiple myeloma with I^{131}, 9: 6850(J)
of tumors, use of γ sources containing Ta^{182} for, 9: 5242(J)
of tumors in urinary bladder, properties and preparation of solutions of $Y^{90}Cl_3$ for, 9: 5243(J)
of urinary bladder neoplasms, intracavitary administration of Co^{60} for, 9: 6169(J)
with x radiation, Ra, and radioisotopes, book, 9: 1458
with x radiation or P^{32}, comparison of results in chronic leukemia, 9: 3037(J)

Radium
body burden determinations for, 9: 2539(R)
Canadian primary standard source of, comparison to U. S. standard, 9: 7577(J)
combined with Au^{198}, in therapy of carcinoma of cervix uteri, dosimetry, 9: 5872(J)
comparison of radiation from ampoules of, 9: 1616(J)
contribution of, to natural radioactivity of man, 9: 444(J)
decay schemes and conversion electrons, 9: 383(J)
determination in Ra–Ba mixtures, 9: 4387(J)
determination of, in ancient marine sediments, 9: 7764(J)
determination of, in minerals with proportional counters, 9: 957(J)
in vivo determination of small amounts of, in human skeleton, 9: 1980(J)
excretion and body burden of, 25 years after injection in man, 9: 4361(J)
ion exchange of, from Th at high temperatures, 9: 593(J)
electrochromatographic separation of, from principal radioactive daughters and Ba, 9: 4106(J)
exchange with Ca in prototype bone apatite, 9: 847
gamma emission, energy measurement by secondary electron absorption, 9: 809(J)
ingestion of, by luminous dial workers, late pathological effects, 9: 40(J)
metabolism of, in dogs, 9: 4911(R)
natural body content of, in young males and detection of low-level γ radiation from, in humans, 9: 6820(R)
precipitation from U ore concentrates, 9: 3155(J)
precipitation of, with $BaSO_4$, 9: 1207(J)
protection against radiation from, handbook, 9: 1452(J)
radiometric determination of low-level, 9: 5721(R)
separation from Ba by fractional precipitation as the chromate, 9: 7731(J)
separation from natural products by paper chromatography, 9: 909(J)
standards, comparison of four national, experimental procedures for, 9: 1129(J)
standards, radiation balance for comparison of, 9: 1050(J)
standards, statistical analysis of comparisons of four national, 9: 1130(J)
therapy, skin cancer following, 9: 32(J)
toxicology of, for lambs, 9: 1156(R)

Radium chlorides
clinical uses, late pathological effects, 9: 40(J)

Radium compounds
salts, chronic toxic effects on humans, 9: 4928(J)

Radium ions
elution behavior of, from sulfonic acid resins, 9: 5298(J)

Radium isotopes Ra^{222}
decay schemes and nuclear spectra, 9: 4863

Radium isotopes Ra^{223}
decay, intensity of conversion electron spectrum following, 9: 2975(J)
energy level scheme, 9: 6109(J)
half lives, 9: 2952

Radium isotopes Ra^{224}
biological effects of, on human skin, mode of action, 9: 5856(J)
concentration of, in drinking water of the Chicago and Frankfurt am Main, Germany, areas, 9: 3231(J)
cutaneous absorption and biological effects of, following introduction by iontophoresis, 9: 6585
decay schemes and nuclear spectra, 9: 4863
rises in skin therapy, radiation hazards, 9: 4688(J)

Radium isotopes Ra^{225}
decay schemes and nuclear spectra, 9: 4863
radioactivity, 9: 2500

Radium isotopes Ra^{226}
concentration of, in drinking water of the Chicago and Frankfurt am Main, Germany, areas, 9: 3231(J)
decay schemes and nuclear spectra, 9: 4863
effects of intravenous injection in dogs, 9: 6843(J)
energy levels, 9: 2897(J)
excretion, following simultaneous injection with Ca^{45}, 9: 2547(R)
internal conversion, 9: 5184(J)
quantitative determination of γ radiation from internally deposited, in dogs, 9: 3591(J)
separation of, facilities for, design, 9: 552(J)

Radium needles
(See Radioapplicators.)

Radium poisoning
in radium dial painters, case histories, 9: 5721(R)

Radon
adsorption on charcoal, 9: 5721(R)
assay, simplified scintillation counter for, 9: 2874(J)
concentration in air, determination of, 9: 7036
in concrete, release in radiant heating, 9: 2066(J)
detection and measurement with portable ionization chamber apparatus, 9: 2855
detection of, in atmosphere by adsorption on charcoal and counting RaC particles, 9: 6099(J)
determination of, 9: 2539(R)
distribution of, in radium-burdened animals, spectrometric determination, 9: 6420(J)
exposure unit for small animals, 9: 1728
in human breath, detection an measurement, equipment, 9: 4360(J)
inhaled, quantitative determination of γ radiation, 9: 3591(J)
injected, biological effects of α particles from, in mice, 9: 2564(J)
leakage from U minerals, measurement of, 9: 4999(J)
physiological effects, toxicology, and bibliography, 9: 3010
radiometric determination, 9: 4911(R)
radiometric determination of, in air of mines, design and performance of scintillation detector for, 9: 4510
radiometric determination of, in breath, 9: 5721(R)
radiometric determination of small amounts of, in air, 9: 6402

Radon (cont'd)
toxicity of, in deep uranium and nonuranium mines, 9: 6861(J)

Radon isotopes
alpha decay in, relation to shell model, 9: 1999(J)

Radon isotopes Ra^{211}
gamma-gamma coincidence studies, 9: 7185
internal conversion electrons, 9: 7185

Radon isotopes Rn^{218}
decay schemes and nuclear spectra, 9: 4863

Radon isotopes Rn^{222}
half life, 9: 2960(J)

Rain water
artificial radioactivity in, in Tokyo, 9: 6848(J)
radioactivity in, following atomic explosions, 9: 6116(J)
radiometric analysis of, for naturally occurring Be^7, 9: 3655(J)

Raleigh
meteorological conditions at affecting dispersal of smoke from reactor, stack, 9: 3978

Raman effect
applications of, to intermolecular interactions, review, 9: 1339(J)
intensity of lines in, calculation by the method of orbitals, 9: 2887(J)

Rare earth alloys
mechanical properties of a Co-base alloy, effects of rare earth additions on, 9: 4457
history of, in foundries in the U. S., 9: 7372(J)
room- and elevated-temperature mechanical properties and heat treatment, 9: 3840(R)

Rare earth chlorides
separation of Gd from, 9: 7987(P)

Rare earth complexes
with cupferron, pyrolysis, 9: 5920(J)
with ethylenediaminetetraacetic acid, physical properties, 9: 6617(J)
with ethylenediaminetetraacetic acid and cyclohexanediamine-tetraacetic acid, relationship between structure and spectra in, 9: 1217(J)
formed by addition of methylamine to rare earth(III) chlorides, 9: 2667(J)
with N-hydroxyethylethylenediaminetriacetic acid, stability, 9: 5618
with naphthazarin, absorption spectra, 9: 4753(J)

Rare earth compounds
with cyclopentadiene, 9: 3096(J)
polarographic behavior of, in molten ammonium formate, 9: 7292

Rare earth deposits (Calif.)
occurrence in Mountain Pass District, 9: 3837(J)

Rare earth fluorides
equilibrium pressures, apparatus for measuring, 9: 4705(R)

Rare earth ions
excited states of, operator equivalents and matrix elements for, 9: 2977(J)

Rare earth–magnesium alloys
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)

Rare earth–magnesium–manganese alloys
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)

Rare earth–magnesium–zirconium alloys
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)

Rare earth minerals
determination of Th and rare earths in cerium minerals, 9: 5608(J)
distribution of, in Ariz., Canada, Ceylon, Colo., Va., Finland, India, N. Mex., Sweden, Texas, and Union of South Africa (Cape Province), 9: 7335
stillwellite, occurrence in Queensland, 9: 7338(J)

Rare earth nitrates
crystal structures of hydrates, 9: 5278(J)

Rare earth oxalates
solubility products, 9: 1218(J)

Rare earth oxides
cerianite, discovery, analysis, and crystal structure of, 9: 6654(J)
heat and free energy of formation, 9: 529(J)

Rare earth salts
solubility, 9: 6225(J)

Rare earth sulfates
instability constants of complex, 9: 1218(J)
symmetry of local crystalline field about ions in $Nd_2(SO_4)_3 \cdot 8H_2O$ crystals, 9: 2981(J)

Rare earths
(See also specific elements.)
absorption spectra and electron energy levels, 9: 4392(J)
absorption spectra, transitions between states and quantum numbers for excited states from, 9: 2979(J) 2980(J)
chromatographic separation, 9: 6906(J)
chromatographic separation of, on paper impregnated with ion-exchange resins, 9: 3108(J)
determination by x-ray fluorescence, 9: 6541
determination in U by ion exchange, 9: 884(J), 1793(J)
determination in Zr, 9: 5890(J)
electrolytic separation of Th from, 9: 7986(P)
fractional crystallization of, by precipitation of Mg nitrate salts, effects of method on effectiveness, 9: 115(J)
gravimetric determination in cerium earth minerals, 9: 5608(J)
ion exchange of, effect of amino polyacetic acids and exchanger form on, 9: 113(J), 5919(J)
lung deposition and biological effects of, in guinea pigs, 9: 7254(J), 7255(J), 7256(J)
metabolism of, in rats, 9: 7654
neutron resonances, 9: 1132(J)
paramagnetic resonance in, theory, 9: 2074(J)
properties and reactor applications, 9: 6476
radiometric determination, 9: 2634
rapid extraction of La oxide from, with nitric acid and NH_3 gas, 9: 902(J)
rapid separation of, by ion exchange with lactic acid as eluant, 9: 3427(J)
recovery from monazite sands, 9: 592(J)
reduction mechanism, 9: 5602(J)
separation and analysis by paper chromatography, 9: 584(J)
separation and estimation of Th from, 9: 594(J)
separation by selective oxidation of sulfites, 9: 6615(J)
separation from Th by solvent extraction, 9: 6620
separation from transuranic elements by ion exchange, 9: 7985(P)
separation from Y by a chromate process, 9: 6616(J)
separation in ion-exchange columns, 9: 6621(J)
separation of, from low-alloy construction steels, bibliography, 9: 4104
separation of, using (ethylenediamine)tetraacetic acid, 9: 3428(J)
separation of Th from, with organic bases, 9: 7705(J)
separation of ThO_2 from, using urotropine, 9: 3431(J)
separation with ethylenediaminetetraacetic acid, 9: 4409(J)
spectrographic determination of, in Dy, Ho, and Er, 9: 5272(J)
x-ray absorption spectra (L), 9: 4904(J)

Rare gases
(See also specific elements.)
charge transfer cross sections of protons, H ions and He ions in, 9: 2806(J)

Rare gases (cont'd)
exchange of vibrational and translational energy between, and excited iodine molecules, 9: 3571(J)
purification by active metals, 9: 2382

Rate meters
(See also Radiation detection instruments (ion current type.)
for accurate measurement of pulse repetition frequency, 9: 711(J)
circuits for neutron survey equipment, design, 9: 3250
for continuous monitoring of tritium in air, 9: 7450
for detection and measurement of γ radiation, calibration, 9: 1602(J)
for detection and measurement of x radiation, design, 9: 5437(J), 5438(J)
for determinations of Rn in air, design, 9: 6402
for distinguishing Pu from U, design, 9: 1598
general purpose log counting rate meter, design, 9: 1317
for measuring γ radiation from 0.1 r to 1000 r/hr, design, 9: 5724
monitor for airborne α particles, design, 9: 5435(J)
for monitoring clothing, design, 9: 6404
performance of, in β dosimetry, 9: 5439(J)
phototube-phosphor, for γ survey, design, 9: 5442(J)
portable, performance as floor monitors, 9: 1315
for radioiodine stack monitoring system, design, 9: 7854
for radiological defense use, design, 9: 2415
for scintillation spectrometers, 9: 696
survey meter for rapid analysis of β and γ intensities from fall-out, 9: 5206(R)
for survey purposes, design, 9: 5731(J)
for tracer measurements of fluid velocity distributions, design, 9: 4988

Rats
effects of single and multiple doses of 400 Kvp and 22 Mev radiation on, 9: 7239(J)
hypophysectomized, response to x radiation, 9: 6841(J)
intestinal flora in, effects of total-body irradiation on, 9: 6161(J)
irradiated, increased incorporation of C^{14}, 9: 5852(J)
lethal dosage determination of radiation for, 9: 1720
lethal effects of radiation, 9: 2567(J)
metabolism of Te^{132}–I^{132} mixtures in, 9: 3754(J)
radiometric analysis of, design of an in vivo holder and counting tube, 9: 5571
respiratory patterns by C^{14}-labeled bicarbonate and lactate, 9: 7272(R)
spontaneous tumors in, a literature survey, 9: 2545(J)

Ray-Welch-Willmore Claims (Calif.)
geology and mineralogy, 9: 3837(J)

Reaction mechanisms
acid decarboxylation, 9: 5883(J)
of competitive processes when reactive fragments are produced in pairs, 9: 4371(J)
gas phase, automatic pressure recorder for study of, 9: 2834(J)
of gaseous reactions, kinetics, 9: 6874
isotope effect in, review, 9: 7851(J)
panoramic mass spectrometer for chemical kinetic studies, 9: 2407
rate theory and homogeneous reactions, review, 9: 3062(J)
substitution and exchange reactions, tracer studies, 9: 7714(J)

Reactor components
pumps for reactor coolants, tabulation, 9: 7534(J)

Reactor control elements
design of, using BF_3, 9: 5147

Reactor control elements (cont'd)
power-level amplifier, design of, 9: 6444(R)
transistor magnetic amplifiers used as, 9: 7931(J)

Reactor control rods
calibration in BSF from reactivity effects, 9: 7150
conical drum actuator for, 9: 6064
effectiveness in water-moderated reactors, theory, 9: 4285
gas seal for, design and testing, 9: 3121
neutron absorption in black, theory, 9: 4564
neutron capture and scattering analysis, 9: 346
theories of, comparison of, 9: 2910(J)

Reactor control systems
amplifier for, 9: 7436(J)
automatic, design of, 9: 1082(J)
drive mechanisms for rods, design and testing, 9: 5496(J)
general discussion of, 9: 6475
latch for drive units, design and performance, 9: 6478
solid state devices used in, 9: 7931(J)

Reactor coolants
(See also appropriate subheadings under specific reactors and under specific substances used as coolants.)
liquid metal, bibliography, 9: 1080
water, gas, and liquid metal cooling systems, general discussion of, 9: 6475

Reactor cooling systems
(See also appropriate subheadings under specific reactors.)
contamination due to leaks in, 9: 5657(R)
leaks in, radiation hazards due to, 9: 6999(R)
leaks in, radioactive contamination from, 9: 6678(R)
pumps for, tabulation, 9: 7534(J)
thermoelectric electromagnetic pumps for liquid metal, theory and applications, 9: 6643

Reactor engineering
a catalog of unclassified data on nuclear reactors, 9: 7922
core container, design and fabrication problems, 9: 5501(J)
general course outlines and engineering problems of ORSORT, 9: 5833
general discussion of, and designs, 9: 6475
laboratory manual in, ORSORT, 9: 6066
liquid metals in, application, 9: 3643(J)
outlines of lectures on, 9: 6767
survey of the swimming pool-type reactors, 9: 4869

Reactor experimental facilities
design requirements for and services available at NRX, 9: 7923
radiation dosages from MTR γ irradiation facility, 9: 2050
reactivity effects in BSF and swimming pool reactors, 9: 7150

Reactor fuel alloys (liquid)
testing of U–Bi alloy on stainless steel, 9: 3285

Reactor fuel elements
cladding for Na-cooled fast, tests of Globeiron for, 9: 2776(J)
calculations of shielding for handling of burned-out, 9: 2984
fabrication, 9: 7154(J)
interlocking plate for charging dissolver of, 9: 587(J)
irradiated, facilities for handling, 9: 577(J)
loading equipment, 9: 5497(J)
processing, remote-control equipment for, design, 9: 558(J)
recovery of U from, at the Arco Chemical Plant, 9: 6187
remote sampling by electrolytic drilling, apparatus and procedure, 9: 3862
reprocessing methods for recovery of uranium and plutonium, 9: 3289(J)

Reactor fuel rods
neutron capture and scattering analysis, 9: 346
production from U and UO_2, 9: 3711(J)
Reactor fuel tubes
heat exchange analysis, 9: 4565(J)
Reactor fuels
liquid metal, aqueous, and fused salt, general discussion of, 9: 6475
preparation and radiation damage, 9: 7154(J)
Reactor materials
(See also appropriate subheadings under specific reactors; see also specific materials.)
composition, preparation, properties, and testing of ceramic coatings for high-temperature alloy parts as, 9: 2249(J)
cross section data presented at Geneva conference, 9: 7101(J)
effects of radiation on, review, 9: 7183(J)
fissionable and construction, general discussion of, 9: 6483(J)
functions and properties of, 9: 6476
of high cross section, general properties of, 9: 6476
for moderators, coolants, reflectors, controls, shielding, etc., 9: 6067(J)
production, corrosion, and radiation damage, 9: 7155(J)
Reactor matrices
buckling, multiplication factor, and thermal utilization factor, experimental determination, 9: 7925(J)
criticality calculations for homogeneous, 9: 6141
diffusion parameters of thermal neutrons in H_2O, 9: 1387(J)
fast neutron multiplication factor, measurement, 9: 7929(J)
neutron density analysis, 9: 346
neutron resonance absorption measurements, 9: 7890(J)
neutron resonance absorption measurements in graphite, 9: 7889(J)
temperature effects of the multiplication constant, 9: 7926(J)
uranium–water, fast fission factor and neutron age calculations, 9: 7928(J)
Reactor moderators
(See also specific materials used as moderators and specific reactors.)
hydrogenous, neutron age and slowing down in, 9: 2927
neutron diffusion in, "random walk" method applied to, 9: 5463
neutron resonance escape probability in infinite homogeneous, 9: 7066
neutron scattering analysis, 9: 346
Reactor oscillators
design, for neutron absorption cross sections, in BEPO, 9: 694
Reactor reflectors
energy-dependent albedo, 9: 4300
reactivity effects in BSF and swimming pool reactors, 9: 7150
Reactor safety
AEC inspection program for, 9: 3290(J)
meteorological factors affecting, 9: 7492
slim safety rod, simulation, 9: 6063
Reactor shield voids
neutron transmission through bent ducts and cylindrical ducts in water, 9: 7957
reactivity effects in BSF and swimming pool reactors, 9: 7150
Reactor shielding
(See also appropriate subheadings under specific reactors and shielding materials; see also Shielding.)
design method for minimum cost, 9: 5498(J)
distribution of fission products from U^{233}, 9: 5776
gamma, neutron, geometry of, and materials of, 9: 6474
gamma attenuation in Zr shield, 9: 2030
gamma scattering in a shadow shield, 9: 2027
Reactor shielding (cont'd)
high-density concretes, properties and construction techniques, 9: 5500(J)
photoneutron production in, containing C, 9: 2518(J)
properties of barytes-colemanite concrete, 9: 6543
thermal shield design, 9: 5499(J)
Reactor simulators
(See also Computers.)
design and performance of HRE, 9: 371
development of analog computer for, 9: 7449
electric circuit analog for neutron diffusion, 9: 3287
electric circuits and analysis, 9: 2014(J)
electromechanical, design, 9: 6063
xenon poison, design, 9: 6705
Reactor slurries
description and characteristics, 9: 7154(J)
Reactor solutions
(See also Reactor fuel alloys (liquid).)
decontamination by stripping gaseous fission products, 9: 7921
neutron diffusion, 9: 5493
Reactor technology
physics and shielding, general discussion of, 9: 6474
Reactor thermal columns
neutron distribution from, 9: 7531(J)
Reactors
(See also specific reactors by name; see also reactors by type, e.g., Graphite moderated reactors.)
adaptation of multigroup methods to cylindrical geometries, 9: 369
amplifiers for control of, development of, 9: 1308(J)
bibliographies, 9: 6185, 6186
boiling water, turbine contamination in, 9: 6480(J)
book, nuclear engineering, 9: 7535(J)
calculation of critical Laplacians by one-group diffusion theory, 9: 6808
calibrating equipment for flux monitors, 9: 298
a catalog of unclassified data on, 9: 7922
ceramic coatings for use in, 9: 1253(J)
choice and design of, 4871(J)
contamination by radioactive leaks in, 9: 6678(R)
control, 9: 3295(J)
control rods, conical drum actuator for, 9: 6064
control rods and poison level, simulation, 9: 6063
core, self absorption of neutrons in, analysis of, 9: 6028
core containers, design and fabrication problems, 9: 5501(J)
description of first Soviet, 9: 7924(J)
design, operation, and utilization of products of, outline, 9: 6767
design, patent of E. Fermi and L. Szilard for, 9: 5564(P)
design and construction of, for industry and universities, 9: 1643
design of a gamma-measuring ion chamber for use in, 9: 3926
diffusion and transport theory approaches to, with transverse air gaps, comparison of, 9: 7530
diffusion equation computation sub-routine for regular Bessel functions, 9: 7065
diffusion in cylindrical, theory, 9: 7149
effect of positive temperature coefficient on stability and transfer function, 9: 3286
fission product distribution in fuel at various time intervals, 9: 5776
gamma decay after shutdown, 9: 3977
general discussion of, including problems, moderators, coolants, reflectors, controls, shielding, 9: 6067(J)

Reactors (cont'd)
German, regulations and problems concerning, and physics summary for, 9: 3640(J)
group theory, including criticality and poisoning studies, 9: 6062
heat transfer studies, 9: 6444(R)
homogeneous control of cylindrical, theory of, 9: 7147
instrumentation, survey of, 9: 7449
kinetic effects of delayed neutrons, 9: 3642(J)
kinetics, effects of delayed neutrons and temperature, 9: 3975
kinetics of, with reflectors, using two-group model of neutron multiplication, 9: 375(J)
multigroup approximation to Boltzmann equations for criticality computations, 9: 2447
multigroup program for Univac, 9: 7152
neutron diffusion in iterative scheme for, 9: 5716
neutron flux depression by foil detectors, 9: 3291(J)
neutron flux distribution from thermal column face, 9: 7531(J)
neutron flux measurements, 9: 318(J)
neutron spectra, 9: 1085(J)
nitrogen fixation in, 9: 3094(J)
nomographs for calculation of hazards from nuclear incident, 9: 36(J)
operating principles, cost, safety, and uses of research, 9: 2448(J)
poison simulator design, 9: 6705
power level measuring equipment, 9: 2909(J)
power variation with increased reactivity, 9: 3974
radiation flux field outside of spherical, calculations of, 9: 6687(J)
safe operation of, AEC inspection program, 9: 3290(J)
separation of U, Pu, and fission products from nuclear fuels, 9: 591(J)
theory, approximation methods in, 9: 7930(J)
two-space-dimension multigroup theory, 9: 4846
water purification in, mixed bed ion exchange method for, 9: 4570(J)

Recapture Member (Ariz.)
geology, 9: 1828

Recorders
(See Data recording systems.)

Red Canyon District (Utah)
mineralogy, 9: 1829

Red Canyon Quadrangle (Colo.)
geology, preliminary map of, 9: 1262(J)

Red Desert Area (Wyo.)
geochemistry and mineralogy of uraniferous coal deposits in, 9: 7337(J)
stratigraphy and U distribution in, 9: 2263

Reduction
electro-, of anions, theory, 9: 856(J)
inorganic oxidation-reduction reactions involving electron transfer, discussion of, 9: 6892(J)
radioinduced, asymmetry of action of H and OH radicals in, 9: 1216(J)

Reflection
differential spectrophotometric measurement of, in chromatography, 9: 3395(J)

Reflectometers
for monitoring power flow in coaxial lines, 9: 7054

Reflector moderated reactors
multiplication factors in, calculations, 9: 7157(J)

Refraction
indices of polycyclic hydrocarbon crystals, 9: 7300(J)

Refractometers
microwave, for water vapor measurement, 9: 7057

Refractories and crucibles
(See Ceramic materials.)

Refractory materials
(See also specific materials; see also Ceramic materials.)
boride-base, properties and uses, 9: 4440(J)
eutectic sintering of cemented metal-base, formation and disruption of skeleton during, 9: 2250(J)
influence of, on contamination of steel with non-metallic inclusions, 9: 7753(J)
mechanical properties and oxidation, 9: 7330(J)
metallurgical evaluation, for molten Ti crucibles, 9: 2246, 2247, 2248
preparation and thermal conductivity, 9: 946(R)
production, cost factors, and uses of zirconia, 9: 151(J)
for range 0.4 to 2.6μ, 9: 2521(J)
reaction of Th with, at high temperatures, 9: 1247
thermal conductivity, methods of measurement, 9: 7327(R)

Refrigeration
three-stage, mechanical, system, design and performance, 9: 5931

Relays
coaxial mercury, for fast pulse generation, 9: 7433
electric insulation, 9: 6354

Rem-Cru Titanium, Inc., Midland, Penna.
progress reports on development of Ti alloys for ordnance use, 9: 47[illegible]

Remote-control equipment
(See also Laboratory equipment; Servomechanisms.)
automatic liquid sampling system, 9: 568(J)
for chemical separation, design, 9: 570(J), 571(J)
crane and fork-lift designs, 9: 561(J)
design, 9: 555(J), 556(J), 557(J), 1436(P), 7306
design and function of a general-purpose overhead manipulator for radioactive materials, 9: 606(J)
design of, for chemical operations on 1 to 2 curies of $\beta-\gamma$ activity, 9: [illegible]
design of, for handling frangible radioactive articles, 9: 1441(P)
design of, for remote metallography, 9: 562(J)
design of metallograph, 9: 2194
for disassembling circulating loop exposed in Low Intensity Training Reactor, 9: 752(J)
for handling irradiated fissionable materials, 9: 577(J)
for handling irradiated fuel-specimen capsules, 9: 564(J)
for hot metallography, 9: 563(J)
mobile shield for cyclotron target removal, 9: 810(J)
for opening irradiated samples, 9: 661(J)
for pipetting micro-amounts, design, 9: 559(J)
for preparation of γ sources, 9: 572(J)
for preparation of neutron sources, 9: 573(J)
for processing reactor fuel elements, design, 9: 558(J)
for radiochemistry procedures, 9: 576(J)
for radiometallurgy laboratory, design, 9: 575(J)
sampler for radioactive liquids, 9: 1424(P)
sampling metallic solids by electrolytic drilling, 9: 3862
for solid-state laboratory, design, 9: 574(J)
stereoscopic periscopes for use with, 9: 566(J)
storage and sampling unit, large-scale automatic, 9: 569(J)
for studies of physics and metallurgy of radioactive materials, 9: [illegible]
for welding stainless steel tubes, design, 9: 631

Remote-viewing equipment
periscope for viewing 2000-c Co^{60} unit, 9: 7390

Rensselaer Polytechnic Inst., Troy, N. Y.
progress reports on Mg sheet alloys, 9: 5653(R)

Rensselaer Polytechnic Inst., Troy, N. Y. Powder Metallurgy Lab.
progress reports on powder metallurgy of Al, 9: 2716(R), 4163(R), 4164(R), 4165(R)

Research and Development Branch, Industrial Group, Windscale Works, Dept. of Atomic Energy, Windscale, Cumb. (England)

(See Gt. Brit. Windscale Works, Sellafield, Cumb., England)

Research Inst., Temple Univ.

(See Temple Univ., Philadelphia. Research Dept.)

Research Lab., Allegheny Ludlum Steel Corp.

(See Allegheny Ludlum Steel Corp. Research Lab., Watervliet, N. Y.)

Research Lab. of Electronics, Mass. Inst. of Tech.

(See Massachusetts Inst. of Tech. Research Lab. of Electronics.)

Research reactors

(See also Argonne Research Reactor; Materials Testing Reactor; Michigan Research Reactor; North Carolina Research Reactor; Swimming pool reactors.)

available types and factors to be considered in choosing, 9: 7153(J)

reference material on, 9: 6479

Russian, description, 9: 7153(J)

Resins

(See also Adhesives; Ion exchange materials; Plastics.)

acid anhydride-cured epoxy, preparation and evaluation as plastics, 9: 6640(R)

activity of measurements of Ca, Mg, Na, and K ions in electrolytic solutions with resin membrane electrodes, 9: 2149(J)

anion activity measurements of chloride, sulfate, and La ions with membrane electrodes of anion-exchanging, 9: 2150(J)

deuterization of, for use in separating boric acid from D_2O, 9: 3097

ion exchange, heat of wetting of, 9: 2210(J)

preparation and properties of acid anhydride-cured polyglycidyl ethers, 9: 6639(R)

properties, 9: 3795(R)

sulfonic acid, elution behaviors of alkali metal ions and alkaline earth ions on, 9: 5298(J)

swelling of, in mixtures of water and methanol, ethanol, isopropyl alcohol, and dioxane, 9: 1750(J)

titration, capacity, and swelling of methacrylic acid polymers, 9: 7311(J)

Resistance furnaces

design of, for production of ZrB_2, 9: 6258(J)

Resistance thermometers

design and performance of metal-film, for measuring surface temperatures, 9: 3132(J)

Resistors

life of, in radiation detection instruments, 9: 1329(J)

Resonators

(See Cavity Resonators.)

Respiration

(See also Plant respiration.)

of epidermis, effects of radiation on, 9: 6569(J)

role of, in oxygen effect in x-irradiated bacteria and yeasts, 9: 24(J)

Respirators

having an automatic electronically controlled respiratory cycling valve, design, 9: 3359

Respiratory cycles

in animals, apparatus for continuous $C^{14}O_2$ and CO_2 excretion studies, 9: 7653

oxygen consumption, effects of total-body irradiation and of diet in burros, 9: 2572(J)

Reticulo-endothelial system

effects of intravenously injected P^{32} β particles on, 9: 1717(J)

function, effects of irradiation and of pre-treatment with choline on, in rats, tracer study, 9: 6574(J)

performance of, in removal of bacteria from the blood, effects of total-body irradiation on, in rabbits, 9: 7241(J)

Reynolds Robbins Claims (Calif.)

geology and mineralogy, 9: 3837(J)

Rhenium

accumulation in thyroid gland in rats, tracer study, 9: 5245

ion exchange separation of, from Mo, 9: 1223(J)

natural radioactivity, 9: 804(J)

preparation, fabrication, and physical, mechanical, and electronic properties, 9: 2722(R)

preparation, fabrication, electroplating, physical, chemical, mechanical, and electronic properties, and microstructure, 9: 976

preparation, properties, and industrial uses, review, 9: 7371(J)

proton fission cross sections at 450 Mev, 9: 7552(J)

radiometric determination, 9: 2634

spectrographic determination of, in ores and rocks, 9: 162

Rhenium–barium aluminate compacts

electronic properties, 9: 2722(R)

Rhenium–barium carbonate compacts

fabrication of cathodes, 9: 976

Rhenium–barium carbonate electrodes

performance, 9: 976

Rhenium–barium carbonate–strontium carbonate compacts

fabrication of cathodes, 9: 976

Rhenium isotopes Re^{183}

metastable states, 9: 7128(J)

Rhenium isotopes Re^{184}

decay, 9: 6530(J)

Rhenium isotopes Re^{185}

formation, by decay of W^{185}, 9: 2965(J)

life time of first excited state, upper limit of, 9: 1072(J)

Rhenium isotopes Re^{186}

first-forbidden nonunique β spectra, 9: 4330(J)

thyroidal accumulation, 9: 4039(R)

Rhenium isotopes Re^{188}

selective uptake of, in thyroid gland in rats, 9: 5206(R)

thyroidal accumulation, 9: 4039(R)

Rhenium isotopes Re^{190}

preparation of, by bombardment of Os, and chemical separations of, 9: 7193(J)

Rhenium oxides

heat and free energy of formation, 9: 529(J)

Rhenium–thorium alloys

fabrication and microstructure of arc-melted, 9: 976

Rhenium–thorium oxide compacts

fabrication, mechanical properties, microstructure, and thermionic emission, 9: 976

Rhodium

adsorption of O_2, H_2, and CO on evaporated films of, 9: 2159(J)

determination of, as sulfide, 9: 82(J)

film-surface area of evaporated, measurement, 9: 3887(J)

gamma ray yields from Coulomb excitation, 9: 6052(J)

radiometric determination, 9: 2634

separation from Pd, Pt, and Ir, by ion exchange, 9: 7988(P)

Rhodium fluorides

crystal structure, 9: 6912(J)

Rhodium isotopes Rh^{97}

half life determination of, 9: 7061(J)

Rhodium isotopes Rh^{99}

half life determination of, 9: 7061(J)

Rhodium isotopes Rh^{99}

half life determination of, 9: 7061(J)

Rhodium isotopes Rh^{102}

decay by electron capture, 9: 2954(J)

gamma spectra, 9: 2958(J), 4520(J)

Rhodium isotopes Rh^{103}

alpha cross sections and proton energy distribution from (α,p) reaction, 9: 7893(R)

energy levels, 9: 1408(J) 2970(J), 3342(J)

gamma rays from Coulomb excitation, angular distribution of, spin sequence from, 9: 6053(J)

nuclear magnetic moments, 9: 5484(J)

Rhodium isotopes Rh^{105}

decay scheme, 9: 2955(J)

half-life determination, 9: 4205(R)

Rhodium isotopes Rh^{107}

half-life determination, 9: 4205(R)

Rhodium–platinum alloy–platinum couples

calibration of, against standard Pt resistance thermocouples, 9: 185

Rhyolitic Tuff Deposit (Nev.)

uranium distribution, 9: 1524

Ribonucleic acid, desoxy-

birefringence, 9: 2164

effects of radiation on, in solid states and in solutions, 9: 6224(J)

metabolism, effects of irradiation on, in rats, tracer study, 9: 4918(J)

phosphorus incorporation into, effects of irradiation in mice, tracer study, 9: 5845(J)

Ribonucleic acid, desoxy-, sodium salts

proton magnetic resonance line broadening in aqueous, 9: 2151(J)

self diffusion of water in aqueous solutions of, hydration data computed from, 9: 2151(J)

Ribulose phosphates

(See Phosphoric acid, ribulose esters.)

Richardson Basin District (Utah)

mineralogy, 9: 1829

Ridenour Mine (Ariz.)

exploration, geology and mineralogy, 9: 7334

geophysical exploration, geology, and mineralogy, 9: 7334

Rivers

(See Surface waters.)

Riveted joints

creep and creep-rupture characteristics of Al alloys and stainless steel, 9: 5356

Robinson Claims (Nev.)

geology and U occurrence, 9: 6963

Roc Creek Quadrangle (Colo.)

preliminary geologic map of, 9: 7340(J)

Rock Creek Prospect (Alaska)

exploration, 9: 628(J)

Rock drilling

equipment for, 9: 624

statistical analysis of, on Colorado Plateau, 9: 624

thermoluminescence, age estimation from, on Pacific atolls, 9: 4995

Rockets

ionic and nuclear problems of propulsion, 9: 7827(J)

operating gases of atomic, thermodynamics, 9: 4772(J)

Rocks

(See also Carbonaceous rocks; Igneous rocks.)

Rocks (cont'd)

age determination by potassium-argon decay, 9: 625(J)

age determination of, from Boulder batholith and other batholiths of Western Montana, 9: 4444(J)

age estimation of, employing rate of growth of Cl^{36}, 9: 5815

analysis for small and large amounts of F in, 9: 5265(J)

atmospheric β ionization from, 9: 3153

contamination, spectrographic determination of, after grinding with alumina ceramic, 9: 3471(J)

distribution and origin of lead isotopes in, 9: 7776(J)

scintillation detectors for use in measuring radioactivity in, 9: 7[illegible]

spectrographic analysis of, for minor elements, 9: 162

spectrophotometric analysis of, for K and Na, 9: 78

surface radioactivity detection by photographic plates, 9: 2707

theoretical effects of diffusion on isotopic abundance ratios in, and associated fluids, 9: 3464(J)

Rods

inner stress, compensation for errors in measurement in the drilling process to detect, 9: 5965(J)

velocity distribution of turbulent flow behind system of thin cylindrical, 9: 4775(J)

Roots

developing, effects of exposure to radiation on mitoses in, of Vicia, 9: 4922(J)

Round Mountain area (Nev.)

thorium distribution, 9: 1260(J)

Rubber

(See also Elastomers; Plastics; Silicone rubbers.)

corrosion resistance and applications of construction, survey and divers[illegible] of, 9: 137(J)

synthesis of, from carbon-fluorine compounds, 9: 4953

three-quantum annihilation of positrons in, 9: 249(J)

vulcanization, isotopic exchange of S in catalytic agents for, 9: 78[illegible]

vulcanization with γ radiation, 9: 4961

Rubber hydrochloride

production of thin films of, 9: 7020

Rubidium

radiochemical determination, 9: 876, 2634

resistivity transition at ~180°K, investigation of, 9: 2341(J)

thermodynamic properties, 9: 7282(J)

Rubidium–antimony alloys

crystal structure, 9: 1893(R)

Rubidium borates

coloration, 9: 4314(J)

Rubidium bromides

fluorescence and thermoluminescence in x-irradiated crystals of, 9: 3682(J)

Rubidium chloride–aluminum chloride systems (liquid)

electric conductivity, 9: 2613

Rubidium chloride–lead chloride systems

thermodynamic properties, 9: 7094(J)

Rubidium chloride–magnesium chloride systems

thermodynamic properties, 9: 7108(J)

Rubidium fluoborates

nuclear resonance spectra, 9: 4641(J)

Rubidium ions

elution behavior of, from sulfonic acid resins, 9: 5298(J)

ion-exchange equilibria on Dowex 50 resins, 9: 6623(J)

Rubidium isotopes
mass ratios of, determined from microwave spectra of alkali halides, 9: 811(J)
Rubidium isotopes Rb^{81}
spin, magnetic moment, and hyperfine structure, 9: 1354(J)
Rubidium isotopes Rb^{86}
enrichment by countercurrent electromigration, 9: 1313(J)
nuclear electric quadrupole moments, 9: 4277(J)
Rubidium isotopes Rb^{89}
beta spectra, 9: 4900(J)
branching ratio, determination, 9: 4625(J)
decay scheme, literature survey, 9: 2069(J)
formation and decay, 9: 2510(J)
half life, 9: 4280(J)
Rubidium isotopes Rb^{87}
analysis of β-decay, 9: 7579(J)
nuclear electric quadrupole moments, 9: 4277(J)
Rubidium isotopes Rb^{88}
decay schemes, measurements and and interpretation, 9: 3332(J)
Rubidium oxides
theoretical analysis of $Rb_4(O_2)_3$, 9: 4067(J)
Rubies
thermal rupture of, effects of shape on, 9: 1503(J)
Ruby Quadrangle (Ariz.)
exploration, geology, and mineralogy, 9: 161
Rupture
(See also appropriate subheadings under specific materials; see also Thermal rupture.)
mathematical analysis of, in materials with two solids in contact, 9: 5932
Rutgers Univ., New Brunswick, N. J. School of Chemistry
progress reports on boron polymers, 9: 7267(R)
Ruthenium
determination of, as sulfide, 9: 82(J)
determination of, in biological material, sample preparation, 9: 3777
radiochemical determination, 9: 876
Ruthenium complexes
with 2,2'-bipyridine, spectral studies, 9: 5613(J)
with tris-2,2'-bipyridine, preparation and chemical properties, 9: 512
Ruthenium isotopes Ru^{94}
preparation and chemical separation of, by irradiation of Mo with He ions, 9: 7194(J)
Ruthenium isotopes Ru^{97}
isolation from Rh^{97}, 9: 7061(J)
Ruthenium isotopes Ru^{99}
neutrino reactions in stars, 9: 1914(J)
Ruthenium isotopes Ru^{103}
beta and gamma spectra, 9: 5186(J)
decay scheme, 9: 1408(J), 3342(J)
disintegration, 9: 2970(J)
fission yield of, from U^{235} and U^{238}, fine structure in, 9: 670(J)
Ruthenium isotopes Ru^{105}
fission yield of, from U^{235} and U^{238}, fine structure in, 9: 670(J)
Ruthenium isotopes Ru^{106}
beta decay, coincidence study of, γ rays from, 9: 2062(J)
from fission, lethal effects in mice, 9: 2547(R)
fission yield of, from U^{235} and U^{238}, fine structure in, 9: 670(J)
toxicity of, for mice, 9: 6820(R)
Ruthenium(IV) oxides
reaction with H_2O_2, 9: 4705(R)
Ruthenium–platinum alloys
electric conductivity, 9: 976
Ruthenium–uranium alloys
crystal structure of URu_2, 9: 6944(J)
Rutiles
(See also Titanium oxides.)
adsorption of methane, A, and Kr on, 9: 3113(J)
Rutin
chemical properties and physiological effects, 9: 3388(J)
Ryan Aeronautical Co., Lindbergh Field, San Diego, Calif.
progress reports on titanium formability and welding characteristics, 9: 1838(R), 1847(R), 3843(R)

S

S particles
(See also K particles; Mesons; V particles.)
decay of, probability for γ-ray emission in, 9: 1061(J)
decay processes, 9: 4205(R)
mass and ranges, 9: 7086(J)
mass and stopping time, 9: 1066(R)
masses of, reconsideration of, 9: 7087(J)
observation of $K_{\pi 2} \rightarrow \pi + \pi^0$ events, 9: 5462(J)
review of, in Annual Reviewed of Nuclear Science, 9: 3957(J)
Saclay Reactor
automatic control of, 9: 1082(J)
neutron spectrum, 9: 3641(J)
Saliva
amylase from, inhibition by U, 9: 5585(J)
Salmon Bay Area (Alaska)
uranium distribution in, 9: 1523(J)
Salt bridges
design of, constructed of porous glass and ion-exchange membranes, 9: 3397(J)
Salt Wash Member
stratigraphic, sedimentary, and structural relationships of U deposits in, 9: 2262(R)
Salt Wash Member (Colo.)
exploration of, in Wray Mesa, 9: 1513
geology of, in Horse Range Mesa Quadrangle, 9: 7775(J)
Salt Wash Member (Utah)
exploration of, in Wray Mesa, 9: 1513
geology of, 9: 160
Samarium
determination in Zr, 9: 5890(J)
energy levels and L absorption spectra, 9: 2899(J)
gamma spectrum after thermal neutron capture, 9: 7907(J)
polarographic studies, 9: 5602(J)
preparation by reduction of Sm_2O_3 with Ca, 9: 2206(J)
separation of Eu from, by electrolysis, 9: 4407(J)
tissue distribution of, in rats, tracer study, 9: 2551(R)
Samarium chlorides
heat of reaction of $SmCl_2$ with HCl, 9: 5295(J)
Samarium complexes
with cupferron, pyrolysis, 9: 5920(J)

Samarium isotopes

decay scheme, 9: 6111(J)

relative yields of, from thermal neutron fission of U^{233} and U^{235}, 9: 4656(J)

Samarium isotopes Sm^{149}

neutron capture cross sections, 9: 4656(J)

Samarium isotopes Sm^{150}

neutron binding energy and nuclear angular moment, 9: 7907(J)

Samarium isotopes Sm^{151}

neutron capture cross sections and half life determination, 9: 4656(J)

Samarium isotopes Sm^{153}

decay scheme, 9: 1683(J)

fission yield of, from natural U, 9: 1700(J)

Samarium nitrates

preparation of anhydrous, by reaction of oxides and NO_2, 9: 112(J)

solvent partition of, between nitric acid and tributyl phosphate, 9: 901

Samarium oxide–gadolinium oxide systems

thermal conductivity, methods of measurement, 9: 7327(R)

Samarium oxide–uranium oxide systems

crystal structure and physical properties, 9: 7318(J)

Samarium oxides

reduction of Sm_2O_3 with Ca to prepare massive Sm, 9: 2206(J)

Sampling

apparatus for, of radioactive liquids, design, 9: 1424(P)

automatic changer design, 9: 3965(R)

industrial, lectures on theory of, 9: 4238

liquid, automatic large-scale, 9: 569(J)

of liquid wastes, design of proportional sampler for, 9: 2656(J)

multi-level continuous plans for, mathematical analysis, 9: 3209

procedures for, in statistical estimations, 9: 5418

of radioactive chemicals, 9: 576(J)

remote liquid, air-lift systems for, 9: 568(J)

statistical analysis of data obtained by, 9: 5420

statistical analysis of economics of, 9: 79

San Rafael District (Utah)

occurrence of rabbittites in Lucky Strike No. 2 Mine in, 9: 3829(J)

San Rafael Group

stratigraphy, 9: 5327(J)

San Rafael River District (Colo.)

stratigraphy, 9: 2262(R)

San Rafael Swell (Utah)

mineralogy, 9: 1829

Sanaste Area (N. Mex.)

mineral determinations in U deposits and prospects in, 9: 5948(R)

Sands

(See also Quartz; Silicon oxides.)

Ottawa, permeability and porosity to fluid flow, 9: 5937

Sandstone deposits (S. Dak.)

occurrence in White River Badlands, 9: 3158(J)

Sapphires

thermal conductivity, 9: 2793(R)

Saskatchewan

uraninite-bearing pegmatite in, mineralogy of, 9: 6275(J)

Scalers

decade-type, design and study, 9: 4842(R), 5995(J)

design of, for measurement of half lives in range 3 sec to 30 min, 9: 2420(J)

Scalers (cont'd)

four-decade gated, circuit for, 9: 5708(J)

glow tube, design and performance, 9: 5723

voltage converter for automatic plotting, design, 9: 3242

Scandium

extraction from wolframite and thortveitite and purification by ion exchange, 9: 3430(J)

neutron total cross section from 0.0015 to 3000 ev, 9: 2905(J)

radiochemical determination, 9: 876

separation and colorimetric determination, 9: 4381

Scandium complexes

with cupferron, pyrolysis, 9: 5920(J)

Scandium compounds

with cyclopentadiene, 9: 3096(J)

Scandium ions

adsorption on charcoal, tracer study, 9: 6889(J)

Scandium isotopes Sc^{43}

decay scheme, 9: 2997(J)

half life and activities, 9: 5533(J)

Scandium isotopes Sc^{44}

capture-positron branching ratios, 9: 1674(J)

decay scheme and γ and low-energy electron spectra, 9: 7893(R)

Scandium isotopes Sc^{46}

absolute standardization by coincidence methods, 9: 6112(J)

Scandium isotopes Sc^{47}

decay and β and γ spectra, 9: 7198(J)

Scandium isotopes Sc^{48}

decay scheme and mass determination, 9: 3343(J)

Scandium oxides

heat and free energy of formation, 9: 529(J)

Scattering

(Limited to theoretical studies of scattering processes of particles in general composite systems; see also appropriate subheadings under specific particles and radiations.)

and compound nucleus formation in nuclear reactions, model for, 9: [illegible]

conference on statistical aspects of nuclear, 9: 5138

Coulomb, cross sections from theory of particles of arbitrary spin for, 9: 5541(J)

cross section and "amplitude" for obstacle in incident plane wave, relation between, 9: 7826(J)

cross section transformations, 9: 417(J)

determination of multiple, from ionization tracks, 9: 4895(J)

elastic, integral term for, 9: 2031

elastic, of charged particles by nuclei, generalized formula, 9: 3667

of electrons by static potential, calculation, 9: 7217(J)

energy losses of particles in matter, 9: 7950(J)

factors for atoms of 23 elements, 9: 6913(J)

of fast charged particles by shielded coulomb field, theory, 9: 3668(J)

of gamma rays by nucleons, theory, 9: 426(J)

limiting processes in formal theory of, 9: 1112(J)

linear extrapolation length of, at surface of imperfectly absorbing cylinders, 9: 3997(J)

many-body, solution by Fredholm's equation, 9: 1113(J)

meson-nucleon, relation between photomeson production and, 9: 4601(J)

meson-nucleon, S matrix expressed in Heisenberg representation for, 9: 3704(J)

Monte Carlo evaluation of single scattering integrals, 9: 2926

multiple, of fast charged particles, theory, 9: 3996(J)

multiple scattering measurements in nuclear emulsions, 9: 3325(J)

Scattering (cont'd)
neutron-deuteron differential angular cross sections, 9: 3995
nucleon-nucleon, formula for differential cross section in, 9: 7500(J)
phase shift, lower limit for energy derivative of, 9: 4335(J)
photon-nucleon, calculation of cross section from experimental photomeson production cross section, 9: 405(J)
pion-nucleon, applications of causality to, 9: 4644(J)
pion-nucleon, in Tamm-Dancoff approximation, 9: 4650(J)
pion-nucleon, theoretical analysis, 9: 403(J)
pion-proton, energy dependence of phase shifts in, 9: 5449
proton-proton, vacuum polarization in, 9: 4606(J)
relation between zero-energy scattering phase shifts, Pauli exclusion principle, and number of composite bound states, 9: 2999(J)
tables of electron scattering solutions by a point charge, 9: 1139
by tensor forces, 9: 6140(J)
theory of multiple, 9: 2029
theory of multiple Coulomb scattering from extended nuclei, 9: 775
triple, experiments, 9: 1660(J)
variational principles applied to, 9: 463(J)
Schroeckingerites
crystal structure and physical and optical properties, 9: 958(J)
occurrence in Moab district (Utah) and Argentina (Mendoza Province), 9: 958(J)
synthesis of, 9: 4975(J)
Scintillation
in phosphors, caused by α, β, and infrared radiation, 9: 7494(R)
theory, 9: 5109
Scintillation detectors
(See also Phosphors.)
application to measurement, in vivo, of radioactivity in organisms, 9: 5121(J)
application to x-ray diffraction, 9: 313(J)
bibliography, containing 500 references, 9: 1036
characteristics of, review, 9: 3942(J)
circuit design, 9: 3941(J)
for counting C^{14} activity on paper chromatograms, design, 9: 4705(R)
design for measuring atmospheric radioactivity, 9: 1045(J)
design for use in petroleum industry, 9: 7861(J)
design of gaseous, 9: 988(R)
design of spherical, 9: 3965(R)
efficiency of, calculations on, 9: 1962
fluctuations in pulse energies, calculations on, 9: 1963
liquid, application of, in radiocarbon dating, 9: 7877(J)
liquid, techniques for detection of natural C^{14} with, 9: 6113(J)
mounting technique for NaI(Tl), 9: 4856(J)
noise analyzers, 9: 1310(J)
optical shutter for use with, design, 9: 703(J)
performance of, for double tracer experiments, 9: 2539(R)
performance of, for following surface diffusion of radioisotopes in metals, 9: 4531(J)
performance of, for measuring low-level γ-activity in the human body, 9: 6820(R)
performance of, in detection of π particles and neutrons, 9: 697
performance of, in determination of Zn^{65} in animal tissues, 9: 3379(J)
performance of, in scintillation counters for fast neutrons, 9: 1036
performance of Hornyak button as fast neutron dosimeter, 9: 7957
photocathode and reflector effects on relative pulse heights of liquid, 9: 7447
preparation of thin plastic, 9: 7455
Scintillation detectors (cont'd)
response of anthracene and stilbene to low-energy protons and x rays, 9: 4962(J)
rise and decay times of, measurement, 9: 301
sensitivity, methods for improving, 9: 1046(J)
simplified, for assay of Rn gas, 9: 2874(J)
thallium-activated NaI crystals as, ionization energy loss of mesons in, 9: 708(J)
theory of scintillation effect in, 9: 5120(J)
with tissue response for fast neutrons, 9: 6425(J)
as tool in radiobiological research, review, 9: 1035
with uranium glass, performance, 9: 5126(J)
x-ray counting efficiency, 9: 4524(J)
zinc sulfide, preparation of, and use in neutron detection, 9: 7880(J)
Scintillators
(See Phosphors.)
Scrubbers
(See also Extraction apparatus; Spray columns.)
design and performance of, for chemical fumes, mists and gases, 9: 932
design and performance of wet dust, 9: 3091(J)
performance characteristics of centrifugal, for aerosol collection, 9: 4125(J)
spray, development, 9: 7692
Sea water
corrosive effects, 9: 3459
corrosive effects of, on brass, bronze and cast Fe, 9: 3148(J)
isotopic content of O_2 and N_2 in, 9: 662(J)
radioactivity induced in, by slow neutrons, 9: 6103(J)
Seals and glands
(See also Gaskets; Vacuum seals.)
ceramic-metal seal production by pressed powder techniques, 9: 4138(R)
electric losses in metal-ceramic seals, 9: 2786
high-temperature gas, for extensometer tensile tests, 9: 1498(J)
insulating seal for high-pressure equipment, 9: 5935(J)
low-cost plastic sealer, 9: 565(J)
metal-ceramic bonding, 9: 5644(J)
for reactor control rods, design and testing, 9: 3121
testing of frozen Na shaft seal, 9: 2689
Sebacic acid, bis [2-ethyl(hexyl)] esters
vapor pressure, 9: 6336
Sedimentary deposits
marine, radioactive equilibrium in, 9: 7764(J)
Sedimentary deposits (Ariz.)
occurrence, 9: 2262(R)
Sedimentary deposits (Colo.)
occurrence in Canon City Embayment Area, 9: 7757
Sedimentary deposits (Nev.)
occurrence in northern Nev., 9: 6963
Sedimentary deposits (N. Mex.)
occurrence, 9: 2262(R)
Sedimentary deposits (Utah)
occurrence, 9: 2262(R)
occurrence in Seven Mile Canyon Area, 9: 6964
Sedoheptulose
labeled with C^{14}, biosynthesis in Sedum, 9: 5303
Seed
(See also specific plants.)
barley, effects of pile radiation on, 9: 3030(J)

Seed (cont'd)
barley, effects of influence of storage conditions, 9: 7632(J)
barley, effects of radiation on, relation of CO_2, O and low temperature to, 9: 2593(J)
of barley, radiosensitivity, 9: 3369(J)
barley, radiosensitivity of dormant and germinating, 9: 5853(J)
induced pollen lethals from, exposed to various radiations, 9: 4671(J)
radiosensitivity of, effects of water content on, 9: 483(J)
sugar content of, effects of irradiation and water content on, 9: 4915(J)
Sego Lilly Lou Open Pit (Colo.)
uranium distribution, 9: 1513
Selenides
synthesis and properties, 9: 5926(R)
Selenious acid
kinetics of H_2O_2 oxidation of, 9: 851
oxidation by hydrogen peroxide, kinetics, 9: 4715(J)
Selenium
proton stopping cross section, 9: 2026
Selenium fluorides
complex with pyridine, preparation, 9: 2220(J)
infrared spectra and molecular structure of SeF_6, 9: 3410
Selenium–iron systems
surface tension, 9: 2702(R)
Selenium isotopes Se^{75}
beta and γ spectra, 9: 7131(J)
decay scheme revision from coincidence studies of γ rays, 9: 2062(J)
spin, quadrupole moment, and mass measurements, 9: 5474(J)
Selenium isotopes Se^{76}
energy levels from decay of As^{76}, 9: 4633(J)
Selenium isotopes Se^{80}
neutron capture by, 9: 6104(J)
Selenium isotopes Se^{81}
nuclear isometry of, 9: 6104(J)
Selenium oxides
heat and free energy of formation, 9: 529(J)
Self-diffusion
coefficients, effect on time of anneal and method of counting radiation on reproducibility of results, 9: 197(J)
coefficients in Cu, effects of neutron irradiation on, 9: 4619
mechanism of, in liquids and water, 9: 5384(J)
in solids, determination by surface activity method, 9: 5248
in solids, using an emanation method, 9: 7280(J)
theory of, in solutes and solvents, 9: 3866
tracer technique for studying, 9: 4531(J)
Semiconductors
(See also specific materials; see also Electric conductivity.)
abstracts of literature on, 9: 3225(J)
design of radioactive cells, using p-n junctions and, 9: 251(J)
diffusion of holes in, 9: 3676(J)
energy spectrum of electrons in, 9: 7048(J)
heat and electric flow in, theory of, 9: 6810(J)
and luminescence, quantum theory of, 9: 6553(J)
in neutron flux measurement systems, 9: 7454(R)
voltage output, effects of radiation on, 9: 3208(R)
Separation processes
(See also appropriate subheadings under specific materials; see also separation processes by type, e.g., Ion exchange processes; Electromagnetic separation.)
Separation processes (cont'd)
analytical control, based on multi-variate regression analysis of process data, 9: 5420
applicable to solid materials, review, 9: 6232(J)
equipment and flowsheets for Metal Recovery Plant (pilot plant scale) at ORNL, 9: 6233(J)
interlocking plate for charging dissolver of reactor fuel slugs, 9: 3871(J)
paper chromatography and paper electrophoresis, manual, 9: 3076(J)
procedure for separations in a drop, 9: 1786(J)
for reactor fuels, 9: 591(J)
for reactor fuels, techniques and estimated costs, 9: 3289(J)
remote-control equipment for, 9: 570(J), 571(J)
summary of methods, 9: 7154(J)
techniques in industrial mineral engineering, 9: 4982(J)
Septicemia
following total-body irradiation in mice, 9: 2553(J)
Servomechanisms
(See also Laboratory equipment; Reactor control rods; Remote-control equipment.)
amplifier design for, 9: 4229
bibliography on, 9: 2828, 2829
computation methods for relay, 9: 6713(J)
for cyclotron dee voltage phase control, 9: 5991
design, 9: 7306
design of 100-amp d-c servostabilizer for β spectrometer, 9: 1584(J)
use of, in liquid metal level indicator, 9: 5990
Seven Mile Canyon Area (Utah)
geology, mineralogy, paragenesis, exploration, 9: 6964
mineralogy, 9: 1829
Sewage
(See also Waste disposal; Waste processing.)
use of radioisotopes in tracing flow of, 9: 613(J)
Shale deposits (Ill.)
lithology and radioactivity of samples from, 9: 6653
Shale deposits (U.S.)
occurrence of U bearing, 9: 5326(R)
Shales
(See also Black shales; Carbonaceous shales.)
analysis, mineralogy, and petrology of U-bearing, 9: 3461(R)
analysis and mineralogy of U-bearing, 9: 621(R)
Shell Development Co., Emeryville, Calif.
progress reports on grease lubrication of bearings, 9: 6679(R)
progress reports on grease lubrication phenomena in open, shielded, and sealed anti-friction bearings, 9: 2790(R), 2791(R)
Shells (geometry)
and shell-like structures, bibliography of articles and books, 9: 3439
circular cylindrical shell under axial compression, buckling of, 9: 5942(J)
thermal stresses in, mathematical analysis, 9: 7740(J)
Shelters
(See also Structures.)
behavior of shock waves entering model bomb, 9: 4762
reduction of γ doses from fall-out in, 9: 2590
Shield Testing Reactor
(See Bulk Shielding Facility.)
Shield voids
(See Reactor shield voids.)
Shielded containers
for iridium (Ir^{192}) source, design, 9: 3901(J)

Shielding

(See also appropriate subheadings under devices shielded; see also main heading by name of radiation shielded, e.g. Gamma shielding; see also Reactor shielding.)

bibliography, 9: 2077

mathematical data, 9: 2983

mobile, for target removal from cyclotron, 9: 810(J)

for 156-in. Liverpool cyclotron, 9: 6087(J)

portable materials for, survey, 9: 4637(J)

stabilization by interlocking bricks, 9: 3345

x- and γ-ray, 9: 7858(J)

of x-irradiated animals, effects of grid size on survival, 9: 4357

Shielding materials

high-density concretes, properties and construction techniques, 9: 5500(J)

Shinarump Formation

mineralogy, 9: 1829

Shinarump Formation (Utah)

geochemical study of stratigraphic section of, 9: 5047(J)

geology, mineralogy, exploration, 9: 6651

stratigraphy of, in Seven Mile Canyon Area, 9: 6964

Ship Rock Quadrangle (N. Mex.)

preliminary geologic map of, 9: 5328(J)

Shock waves

(See also Impact shock.)

from atomic explosions, application in studies on temperature and winds of the ozonosphere, 9: 7491

behavior of, entering model bomb shelters, 9: 4762

density profile of, determination by electron beam method, 9: 5988(J)

detection of, in gas at regions of less than 5 mm Hg, method for, 9: 6383(J)

interaction with a constriction, mathematical analysis of pressure, densities, and temperatures encountered, 9: 1551

propagation, numerical treatment using Von Neuman-Richtmyer method, 9: 6952

separation into elastic and plastic components, techniques for observing, in metals, 9: 3903(J)

visualization by glow discharges, 9: 4431

Sierra Blanca Area (N. Mex.)

geophysical exploration, 9: 2709

Sierrita Mountains (Ariz.)

geology of Black Dyke Prospect in, 9: 5324

Silanes

fluorine-containing, preparation, 9: 4952

fluorine-containing alkyl, synthesis, 9: 5898(R)

hydrolysis, oxidation, pyrolysis, and synthesis of alkoxy- and aryloxy-, 9: 854

hydrolysis and oxidation, 9: 5381

hydrolysis and oxidation of tetra-2-pentoxysilane, 9: 3758(R)

methychloro-, use of vapors to remove adsorbed water in vacuum systems, 9: 944(J)

polymerization of diphenylvinyl-, 9: 6235

synthesis, 9: 4091(R)

tetrapentoxy-, oxidation of, 9: 3382(R)

thermal stability, 9: 4421

triorgano-, hydrogen isotope effects in alkaline cleavage of, 9: 3057(J)

viscosity, 9: 5681(R)

viscosity of, at high temperatures, 9: 5381

Silicane

rotational constants of D-labeled, 9: 3080(J)

Silicides

(See also specific silicides.)

phase diagrams, thermodynamic properties, and chemical reactions, 9: 4704

Silicomolybdic acids

solvent extraction of, in the determination of Si in V and V oxides, 9: 7295

Silicon

absorptiometric determination, 9: 7295

activation analysis of trace impurities in, using scintillation spectrometry, 9: 4729(J)

behavior in and relation to heat treatment of Al–Mg–Si alloys, 9: 6319(J)

colorimetric determination of, following solvent extraction from U metal, 9: 7297

colorimetric determination of, in Ti alloys, 9: 2632

determination of, in U–Si systems, 9: 4074

lattice constants, 9: 3408

neutron total cross sections, 9: 7124(J)

spectrographic determination of, in ores and rocks, 9: 162

Silicon–aluminum–copper–silicon systems

constitution diagrams at 460°C, 9: 6298(J)

Silicon–aluminum–copper systems

corrosion resistance and mechanical properties of, effects of variation of zinc content on, 9: 3541(J)

solidification, effects of vibration on, 9: 3851

Silicon–aluminum–iron systems

equilibrium diagram of, established by liquation, 9: 6323(J)

Silicon–aluminum–magnesium systems

electrolytic polishing, 9: 4189(J)

heat treatment of, and relation to behavior of Si in, 9: 6319(J)

mechanical properties, effects of Na on, 9: 5957

Silicon–aluminum systems

soft x-ray spectra, 9: 3697(J)

Silicon–aluminum systems (liquid)

solubility of solid Al and Al alloys in, 9: 1871(J)

Silicon–aluminum–titanium systems

hardness, crystal structure, and phase studies, 9: 3520

melting techniques and forging temperatures for preparation of, 9: 1850(R)

oxidation, 9: 3849(R)

phase studies and hardness of, 9: 1843(R)

tensile properties and microstructure, effects of heat treatment on elevated temperature, 9: 2719(R)

tensile properties of as-forged, 9: 2279(R)

transformation temperatures, age hardening, heat treatment, and mechanical properties, 9: 1534(R)

Silicon–aluminum–zinc systems

corrosion of, in 95°C, low-conductivity, aerated, distilled water, 9: 2725

Silicon bronze

corrosion by chlorinated and alkalized boiler water and pure deionized water, 9: 3168

Silicon carbide compacts

thermal rupture of, effects of shape on, 9: 1503(J)

Silicon carbide crystals

x-ray scattering effects due to lattice defects, 9: 7835(J)

Silicon carbides

pressing, bonding by metals, and wettability, 9: 6956(R)

properties and reactor applications, 9: 6476

thermal conductivity, 9: 946(R), 4779(R)

Silicon–carbon–iron systems

coefficient of self-diffusion of Fe in, 9: 5067(J)

Silicon–carbon–molybdenum systems

phase diagrams, 9: 4704

Silicon–carbon–niobium systems
phase diagrams, 9: 4704
Silicon–carbon–tantalum systems
phase diagrams, 9: 4704
Silicon–carbon–titanium systems
constitution diagrams, 9: 4187
phase diagrams, 9: 4704
Silicon–carbon–tungsten systems
phase diagrams, 9: 4704
Silicon–carbon–zirconium systems
phase diagrams, 9: 4704
Silicon chlorides
organic, mass spectrometry of, 9: 5105(J)
Silicon–chromium systems
preparation, corrosion, physical properties, and testing, 9: 2740
Silicon–cobalt–molybdenum systems
oxidation at 945 ± 10°C, 9: 3146
Silicon compounds
organo-, chemistry, review, 9: 6693(J)
preparation and polymerization, 9: 6873(R)
Silicon–copper systems
galling and seizing of, by friction coefficients, 9: 1269
Silicon isotopes Si^{27}
beta emission, 9: 1121
beta spectrum, 9: 5755(R)
Silicon isotopes Si^{28}
deuteron reactions (d,γ), energy and intensity of γ rays from, 9: 379(J)
deuteron reactions (d,p), 9: 2008(J)
energy levels, 9: 739(J)
gamma reactions (γ,n) and (γ,p), cross sections, 9: 3301(J)
gamma reactions (γ,p) and (γ,n), yield ratios, 9: 3300(J)
Silicon isotopes Si^{29}
energy levels, 9: 2008(J)
energy levels from decay of P^{29}, 9: 2057(J)
nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)
Silicon junctions
(See also Transistors.)
performance, 9: 7070(R)
Silicon–manganese systems
soft x-ray spectra, 9: 3697(J)
Silicon–nickel systems
phase studies, 9: 3184(J)
Silicon nitrides
fabrication, properties, and applications, 9: 4439(J)
Silicon oxide–aluminum oxide–calcium oxide systems
electrolysis of slags of, containing S, 9: 2135(R)
Silicon oxide–boron oxide–lithium oxide systems
thermal expansion, 9: 1555
Silicon oxide–magnesium oxide systems
thermal conductivity, 9: 4779(R)
thermal conductivity, methods of measurement, 9: 7327(R)
Silicon oxide–nickel systems
heats of adsorption of N on, 9: 1789
Silicon oxide–silicon systems
phase studies and thermal analysis, 9: 7676
Silicon oxide–sodium oxide–zirconium oxide systems
physical and chemical properties and crystallography of phases in, 9: 2138(J)
Silicon oxides
charge equilibrium ratios for H ions from proton bombarded, 9: 2486(J)
diffusion of butane in, dependence on temperature, porosity, and surface concentration, 9: 4755(J)
effects of pile irradiation on, 9: 4011(J)
fast-neutron irradiation effects on optical absorption spectrum, 9: 5382(R)
heat and free energy of formation, 9: 529(J)
moderation of fast neutrons in, 9: 3999(J)
vitreous, neutron damage to structure of, 9: 2497(J)
Silicon oxides (colloidal)
adsorption of boron hydrides by, 9: 53
catalytic properties, effect of neutron radiation on, 9: 7723(J)
gas chromatographic elution of gases and volatile liquids from by H_2, N_2, or CO_2, 9: 2672(J)
Silicon oxides (fused)
coloration of, induced by γ and reactor irradiation, 9: 4102(J)
coloration of, induced by x irradiation and heat treatment, 9: 4103(J)
radiation-induced color centers in, 9: 4315(J)
thermal conductivity, 9: 2793(R)
Silicon–silicon oxide systems
phase studies and thermal analysis, 9: 7676
Silicon steel
corrosion resistance, effect of Mo addition on, 9: 6332(J)
Silicon, tetramethyl-
solubility in C_8F_{18}, 9: 6209(R)
Silicon–thorium systems
phase studies, physical properties, and x-ray diffraction analysis of β ThSi, 9: 4990
Silicon–uranium systems
determination of Si in, 9: 4074
Silicon–zirconium systems
as container material for Ti, evaluation, 9: 4780
Silicone polymers
cross linking and solubility changes of, subjected to high-energy radiation, 9: 5616(J)
synthesis of fluorine-containing alkyl silanes, 9: 5898(R)
Silicone rubbers
adhesion of, to glass fabrics, 9: 4114(R)
Silicones
lubricity for high-temperature ball bearings, 9: 1813
thermal conductivity of viscous, 9: 2336(J)
Silver
absorption of cosmic μ mesons, 9: 721
adsorption of aliphatic compounds on, from aqueous solutions as inferred from H_2 overvoltage measurements, 9: 595(J)
adsorption of hexanethiol by contact angle measurements on, 9: 3111(R)
alpha scattering, 9: 7903
anisotropy of grain-boundary self-diffusion in bicrystals of, 9: 1864(R), 3867(R)
catalytic properties of metallic, in γ ionization of Ag_2SO_4 solutions, 9: 6223(J)
charge equilibrium ratios for H ions from proton bombarded, 9: 2486(J)
corrosion by nitric oxide at high temperature, 9: 6308(J)
coulomb excitation, 9: 1066(R)
cross sections for neutron transmission and multiplication, 9: 3646(J)
decontamination of solutions containing radioactive, 9: 7727
deuteron reactions (d,p) at 15 Mev, proton energy spectra from, 9: 4574(J)
diffusion in AgBr, 9: 1189(J)
diffusion into neutron-irradiated Li, 9: 7797(J)

Silver (cont'd)
diffusion of Zn in, 9: 7001(R)
effects of 12-Mev deuterons on, near 10°K, 9: 2946(J)
elastic scattering and angular distribution of 48.2-Mev α particles by, 9: 7140(J)
elastic scattering of polarized protons from, 9: 4893(J)
elastic scattering of 22-Mev α particles from, 9: 2937(J)
electric properties of, for nuclear batteries, 9: 266
electroforming from cyanide baths, 9: 3495
electron and positron scattering by, at 0.7 and 1.4 Mev, 9: 4611(J)
electron energy loss in, at 30 kev, 9: 6366(J)
electron energy losses in thin foils of, 9: 5790
emission of secondary electrons, (δ rays) by 1.3-Mev electron bombardment, 9: 1306(J)
energy levels study by means of electric excitation by protons, 9: 5476(J)
fast neutron scattering by, 9: 3309(J)
fission induced by protons, 9: 7536
galling and seizing of, by friction coefficients, 9: 1269
gamma ray yields from Coulomb excitation, 9: 6052(J)
gamma rays from Coulomb excitation, angular distribution of, spin sequence from, 9: 6053(J)
gamma reactions (γ,n), 9: 1358(J)
grain-boundary diffusion in Cu bicrystals, anisotropy of, 9: 1285(J)
grain-boundary self-diffusion and anisotropy, 9: 188(R)
growth of whiskers by vapor deposition on glass, 9: 7816(J)
heat of solution, in liquid Sn, 9: 4178
ion exchange on Dowex 50 at 25°C, 9: 3795(R)
lattice constants, 9: 3408
μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)
neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)
neutron reactions (n,nγ), γ spectra from, 9: 4598(J)
neutron resonances, 9: 1073(J)
neutron resonances, measurement of scattering cross sections for, 9: 4588(J)
neutron scattering cross section from 12.9 to 16.2 mev, 9: 6042(J)
proton reactions (p,n), angular distributions and yields at 23 Mev, 9: 4290(J)
proton stopping cross section, 9: 2026
radiochemical determination, 9: 876
secondary electrons from, for primary electrons of 20 kev to 1.3 Mev, 9: 5989(J)
self-diffusion coefficient, effect of time of anneal and method of counting radiation on reproducibility of results, 9: 197(J)
self-diffusion coefficient in, 9: 5348(R)
self-diffusion coefficient in Ag–Pb, Ag–Cu, Ag–Ge, and Ag–Al alloys, 9: 3866
self-diffusion of, in Ag–Tl alloys, 9: 3867(R)
slow neutron cross sections, 9: 1391(J)
solubility of, in molten AgCl, 9: 3052
spallation by 550-Mev α particles, 280-Mev deuterons, and 480-Mev protons, cross sections and yields, 9: 7940(J)
specific heat of, 9: 237(J)
spectrographic determination in Bi, 9: 1475
spectrographic determination of, in ores and rocks, 9: 162
thermal ionization of, ion spectrum, 9: 61(R)
vacancies and energy of vacancy formation in, 9: 3525(J)
wettability of, by Hg, 9: 5052

Silver (liquid)
permeation of graphite by, mechanisms of, 9: 4480

Silver alloys
galling and seizing of, by friction coefficients, 9: 1269

Silver–aluminum alloys
age-hardening of, in thin layers, 9: 2782(J)
constitution diagrams, electric conductivity, and thermodynamic properties, 9: 5661
intercrystalline grains in, growth of, determined by the method of microhardness, 9: 642(J)
thermodynamic properties and phase studies, 9: 2294(R)
thermodynamic properties and x-ray measurement of various phases, 9: 972(R)

Silver–antimony alloys
diffusion coefficient for, over a temperature range 450 to 900°C, 9: 5348(R)

Silver bromides
diffusion of Ag and Pb in, 9: 1189(J)

Silver–cadmium alloys
diffusion coefficients for, 9: 5348(R)
heat of formation, 9: 4178
heat of solution, in liquid Sn, 9: 4178
partial vapor pressure of Cd and thermodynamic properties, 9: 4454
vapor pressures over solid α, equipment for measuring, 9: 3177(R)

Silver chlorides
electron mobility in, temperature dependence, 9: 2352(J)
preparation of crystals for optical studies, 9: 7029(J)
reduction by hydrogen, reaction mechanisms, 9: 3763
reduction by hydrogen and deuterium, 9: 3765
reduction by hydrogen or deuterium, reaction mechanisms, 9: 3764

Silver chlorides (liquid)
solubility of Ag in, 9: 3052

Silver compounds
polarographic behavior of, in molten ammonium formate, 9: 7292

Silver–copper alloys
phase studies and thermodynamics, 9: 5357

Silver crystals
diffusion of Cd, In, and Sn in, tracer study, 9: 668(J)
internal friction of, effects of plastic deformation on, 9: 5054

Silver electrodes
potential of Ag, AgCl and Hg, HgCl combination in HCl, 9: 2623(J)

Silver–gold alloys
stored energy in, by drilling, filing, torsion, wire-drawing, and rolling at room temperature and 78°K, 9: 3177(R)
thermodynamic properties and phase studies, 9: 5662

Silver–gold alloys (liquid)
Gibbs free energy and enthalpy of solution, 9: 3867(R)
thermodynamic properties, 9: 188(R)

Silver–gold couples
surface diffusion, determination of the coefficients of, 9: 5658(R)
surface diffusion coefficients of, methods for determination, 9: 3848(R)

Silver halide crystals
photoelectric and optical properties of AgBr and AgCl, 9: 4839(J)

Silver iodides
adsorption of Ag^+ and I^- on, in absence and presence of lauric acid, 9: 3111(R)
adsorptive properties of, for Ag^+ and I^- in presence and absence of lauric acid, 9: 623(R)
adsorptive studies of flotation agents on, 9: 4980

Silver iodides (cont'd)
surface area measurement of, by the Kr method, 9: 623(R)
Silver iodomercurates
order-disorder phenomenon, electrical conductivity measurements to study, 9: 3890(R)
Silver ions
adsorption of, an AgI in presence and absence of lauric acid, 9: 623(R), 3111(R)
adsorption of, on sphalerite, 9: 3111(R)
adsorption on AgI at pH 7.5 and 9, 9: 4980
Silver isotopes
electrolytic separation of, negative results, 9: 289
Silver isotopes Ag^{106}
gamma spectra from deuteron bombardment, 9: 734
Silver isotopes Ag^{108}
gamma reactions (γ,n), 9: 6090(J)
Silver isotopes Ag^{107}
Coulomb excitation spectra of, 9: 6444(R)
neutron resonance cross sections for, calculated from many-level formula, 9: 6032(J)
Silver isotopes Ag^{109}
Coulomb excitation spectra of, 9: 6444(R)
gamma reactions (γ,α), 9: 3674(J)
gamma reactions (γ,n), 9: 6090(J)
neutron resonance cross sections for, calculated from many-level formula, 9: 6032(J)
Silver isotopes Ag^{110}
beta spectra, 9: 3969(J)
Silver isotopes Ag^{111}
nuclear spin and hyperfine structure, measurement, 9: 7116(J)
separation from neutron-bombarded Pd by isotopic exchange, 9: 7441
Silver isotopes Ag^{112}
gamma spectrum, 9: 4018(J)
Silver Lady Claims (Calif.)
uranium distribution, 9: 3154
Silver–lithium alloys
constitution diagrams, casting, and crystal structure, 9: 2767(J)
Silver–lithium–magnesium alloys
constitution diagram of, 9: 2768(J)
Silver nitrate–sodium nitrate–water systems
activity coefficients at 25°C, 9: 3795(R)
Silver nitrates
adsorption of, on gold surfaces, 9: 3766
adsorption on powdered silver, 9: 3432(J)
viscosity and electrical conductivity relationship in solutions of, 9: 1748(J)
Silver oxides
band spectra of AgO, 9: 3798(J)
heat and free energy of formation, 9: 529(J)
Silver Peak Mountain Area (Nev.)
geology, mineralogy and U distribution, 9: 1524
Silver Pick Property (Nev.)
exploration, 9: 1260(J)
exploration, geology, mineralogy, and U distribution, 9: 1516
Silver powders
adsorption of $AgNO_3$ and KCl on, 9: 3432(J)
grain growth of sintered, effects of particle size on, 9: 2318(J)
Silver Reef District (Utah)
mineralogy, 9: 1829
Silver sulfates
adsorption of, on gold surfaces, 9: 3766
effect of γ radiation on solutions of, 9: 6223(J)
Silver sulfides
adsorption isotherms and capacity curves, 9: 3111(R)
adsorption of potential-determining ions on, 9: 4980
electric conductivity, 9: 1467(R)
electrochemical properties, 9: 4980
solid state reactions, kinetics of, 9: 4995
Silver–thallium alloys
diffusion of Ag and Tl in, 9: 188(R)
self-diffusion of Tl in, 9: 7352(R)
Silver–titanium alloys
constitution diagrams, discussion of, 9: 7362(J)
lattice parameter, resistivity, magnetic susceptibility, and other physical properties, 9: 5055
Silver–zinc alloys
diffusion of Zn in, with admixtures of Au, Ga, Sn, Sb, Al, and In, 9: 3875
relaxation strength, 9: 1537
Simon-Ray Claim (Calif.)
geology, 9: 3837(J)
Singer Mine (Nev.)
uranium distribution, 9: 1260(J)
Single crystals
(See also specific crystals by name of material, e.g., Copper crystals)
cleaning, sorting, and mounting of microscopic, for electrical measurements, 9: 1302
determination of substructures in metal single crystals by means of x rays, 9: 4816(J)
fast-neutron irradiation effects and x-ray scattering, 9: 5382(R)
growth and optical properties, 9: 5380
inelastic scattering of neutrons by, 9: 6506(J)
metal, internal friction of, 9: 5054
preparation of Ti–11% Mo, for study of α-β transformation, 9: 1844(R)
stress-strain machine for testing, design, 9: 7437
Weissenberg x-ray diffraction patterns from, spot width variations in, 9: 6348
Sintering
material transport during, mechanism of, 9: 5388(J)
resistance, under pressure, equipment and methods for, 9: 1878(J)
of stainless steel compacts in H_2 and dissociated ammonia, 9: 2754(J)
Skeleton
(See also Bones.)
retardation of growth of, by irradiation of hemangioma of extremities of infants, 9: 7630(J)
sampling of, by excision of sections of tailbone, in cattle, 9: 1156(R)
Skin
burns of, protective effects of fabrics against, 9: 481
burns of, protection afforded by fabrics, in pigs, 9: 1157
burns of porcine, protection afforded by shielding with cotton fabric, 9: 5572
diffuse reflectance, 9: 2521(J)
diffusion of fluids in, effects of irradiation on, in rabbits, 9: 3742(J)
effects of β particles on, 9: 836(J)

Skin (cont'd)
effects of β radiation on, of burros, horses, cattle, and sheep, 9: 1156(R)
effects of radioactive and chemical carcinogens on, in mice, 9: 2565(J)
effects of x irradiation on epithelium of tadpole tails, 9: 6842(J)
erythema of, following single doses of radiation, 9: 6570(J)
erythema reaction of, following exposure to x radiation and cathode rays, 9: 1158(J)
inflammatory response in, effect of β irradiation on, 9: 630(J)
optical properties of, influence on burn production, 9: 6156
penetration and response of, to applications of thorium X, 9: 5856(J)
pig, effects of thermal radiation on, shielding afforded by a textile, 9: 4050
radiation cancer of, review of 21 case histories, 9: 32(J)
radiation-induced lesions of, role of peroxides in, 9: 5842(J)
radioinduced erythema, inhibition with amino acids, 9: 2602(J)
respiration of epidermis, effects of radiation on, 9: 6569(J)
response to thermal radiation, effects of adrenalectomy on, in rats, 9: 4664
response to thermal radiation, effects of color on, in swine, 9: 4045
response to thermal radiation, time-energy relationship for swine, 9: 5212
of swine, thermal shielding of, effectiveness of treated fabrics, 9: 5211
thermal radiation burn severity, correlation with induced hemoglobinemia, in pigs, 9: 5841
trauma of, formation of new capillaries following, effects of x irradiation on, in mice, 9: 2561(J)
tumors of, effects of inhalation of oxygen on x radiation therapy, 9: 2124(J)

Skin diseases
treatment of, with P^{32}, 9: 7646(J)

Skin grafting
effects of high-dosage x irradiation and injected homologous bone marrow on, in mice, 9: 2560(J)

Slags
electrolysis of $Al_2O_3-CaO-SiO_2$, containing S, 9: 2135(R)
electrolysis of $MnO-FeO-SiO_2$, 9: 4437(R)
ionic nature of liquid iron silicate, 9: 5642(J)
molten silicate, electrolysis in, 9: 1467

Slana Area (Alaska)
exploration, 9: 626(J)

SLEEP Reactor
kinetic experiments with, neutron flux and pile behavior, 9: 6068(J)

Slim Buttes Area (S. Dak.)
geologic map of, 9: 5334(J)
geologic map of southern part of, 9: 5335(J)
uranium distribution, geology, 9: 7758

Slow neutrons
(See Thermal neutrons.)

Slurries
(See also specific slurries.)
heat transfer, thermal conductivity, viscosity, density, and turbulent flow of, 9: 2236(J)

Small Spot Claim (Colo.)
mineralogy, 9: 1829

Smokes
diffusion in atmosphere, measurement, 9: 2539(R)
from Raleigh reactor stack, dispersal, meteorological factors, 9: 3978

Soapstone
(See Steatites.)

Sodium
alignment of atoms in, by scattering of unpolarized light, 9: 245(J)
chromatographic determination of, in mixtures of Na, K, Mg, and Ca, 9: 3400(J)
cleaning of residual, from circulation loops with liquid ammonia, 9: 4179(R)
continuous ion exchange with an endless belt of phosphorylated cotton, 9: 3104(J)
determination of, in Al using flame photometer, 9: 6904(J)
determination of O_2 in, with butyl bromide, 9: 7700(J)
dietary, influence on hypertension in humans, 9: 472(J)
effects on mechanical properties of Al–Mg–Si systems, 9: 5957
electronic specific heat, 9: 6684(J)
energy values of, augmented plane wave method of calculation of, 9: 6546(R)
exchange with K across erythrocyte surface, tracer study, 9: 2099(R)
ion exchange on Dowex 50 at 25°C, 9: 3795(R)
ion exchange separation from Ca and Mg and titrimetric determination of, 9: 1200(J)
mixing of injected, effects of age and sex on, in humans, tracer study, 9: 3730(R)
neutron-activation determination of, in Al alloys, 9: 1204(J)
production by electrolysis of fused salts, 9: 5251(J)
radiochemical determination, 9: 876
reaction with $BF_3 \cdot NH_3$, 9: 515
3s-3p transitions, cross sections for, 9: 5794(J)
self-diffusion coefficients in, near the melting point, 9: 2799(J)
spectrophotometric determination of, in siliceous, argillaceous, and phosphate rocks, 9: 78
surface energies and temperature coefficients, 9: 6669(J)
surface energy of, theoretical determination of, 9: 672(J)
thermodynamic properties, 9: 7282(J)
transport of, in human erythrocytes, tracer study, 9: 1736(J)

Sodium (liquid)
centrifugal pump for, design of, 9: 943(J)
circulation systems, design and testing, 9: 4175(R)
circulation systems, instrumentation, 9: 4179(R)
corrosion of Armco Fe and 347 stainless steel in 1000°F, effect of O_2 on, 9: 948
corrosion of Zr and stainless steel and analysis of, 9: 1254
corrosion testing, 9: 1897(R), 1899(R), 9(R)
corrosive effects on building materials, and solvent properties, 9: 5647(J)
corrosive effects on Globeiron, 9: 1901(R), 1902(R), 1903(R)
corrosive effects on Ti, 9: 1904(R)
density of, from 254° to 860°C, 9: 3386
disposal under water, 9: 4989
flow decay in heat transfer system for, 9: 1806
fluid flow in annuli and heat transfer coefficients between, 9: 6251(J)
handbook, 9: 6664
handling of, design, fabrication, operation, and testing of apparatus for, 9: 3443
heat and mass transfer, 9: 6999(R)
heat transfer and corrosive effects, 9: 4175(R)
heat-transfer coefficient of Zr tubing in, 9: 1254
heat-transfer experiments with, design and performance of apparatus for, 9: 3443
heat-transfer properties and electrical resistance, 9: 4179(R)
heat transfer systems, description and operation, 9: 6953
leak detection, equipment for, 9: 4179(R)

Sodium (liquid) (cont'd)
leak detection of, in vertical piping, 9: 605
level indicator design, 9: 7438(J)
mass transfer by, in Ni or stainless steel loops, 9: 4179(R)
mass transfer in irradiated stainless steel loops circulating, 9: 4179(R)
mass transfer in stainless steel loops, inhibition, 9: 4175(R), 5657(R)
mass transfer of stainless steel components in 925°F, effects of O_2 on, 9: 3827
performance of piston operated valves for, 9: 5318
plugging in vent lines, mathematical analysis, 9: 7349
solubility of Ba and Ba oxides in, 9: 6872
solubility of NaH, Na_2CO_3, and NaCl in, 9: 4702
surface tension, measurement, 9: 2340(J)
surface tension in argon by the drop-volume method, 9: 6668(J)
surface tension of, using vertical Cu, Mo, and Zn plate technique, 9: 229(J)
underwater disposal and effects on electric cable, 9: 5657
viscosity, 9: 1277(J)
wetting of Zn, Cu, and Mo by, 9: 229(J)

Sodium acetates
metabolism of, in pantothenic acid-deficient rate, 9: 61(R)

Sodium acid carbonates
resorption rate of, effects of x radiation and hormones on, in rats, tracer study, 9: 3732(J)

Sodium alloys
flammability of, at high temperatures, 9: 5590

Sodium bicarbonates
(See Sodium carbonates.)

Sodium–bismuth alloys
microhardness and surface tension, 9: 3527(J)

Sodium–bismuth alloys (liquid)
flammability of, at high temperatures, 9: 5590

Sodium borates
chemical reactions, 9: 2613
coloration, 9: 4314(J)

Sodium borohydride–formamide, *N,N*-dimethyl systems
electrolysis, 9: 2615

Sodium borohydrides
chemical reactions and solvent properties, 9: 2615
heat of solution of, 9: 6599
toxicity, 9: 4054

Sodium bromide–aluminum chloride systems (liquid)
electric conductivity, 9: 2613

Sodium bromide–sodium chromate systems
polarization of Mg and Mg alloys in aqueous, 9: 5051(R)

Sodium bromide–sodium systems
equilibrium compositions in, 9: 2154(J)

Sodium bromides
absorption spectra of irradiated, 9: 6868
emission, excitation, and absorption spectra of Ag-activated, 9: 3116(J)

Sodium carbonates
(See Sodium acid carbonates.)
absorption of carbon dioxide by, kinetics, 9: 1791(J)
concentration of O^{18} in water of crystallization, 9: 2267(J)
solubility in liquid Na, 9: 4702

Sodium chlorates
effects of pile irradiation on, 9: 3424(J)

Sodium chloride–aluminum chloride systems (liquid)
chemical reaction, constitution diagrams, self-diffusion, and electric conductivity, 9: 2613

Sodium chloride crystals
color centers in x-irradiated, production and bleaching of, 9: 801(J)
dimensional stability, effects of radiation on, 9: 5276
electric conductivity, effects of radiation on, 9: 800(R)
fluorescence and thermoluminescence in x-irradiated, 9: 3682(J)
internal friction of, effects of plastic deformation and radiation on, 9: 5054
reflectivity for slow neutrons, 9: 6027
thermoluminescence in irradiated, 9: 4317(J)

Sodium chloride–lead chloride systems
thermodynamic properties, 9: 7094(J)

Sodium chloride–magnesium chloride systems
thermodynamic properties, 9: 7108(J)

Sodium chloride–potassium chloride systems (liquid)
explosions with water, prevention of, 9: 1743

Sodium chloride–sodium chromate systems
corrosion and polarization of Mg and Mg alloys in aqueous, 9: 5051(R)
corrosive effects of Mg and Mg alloys, 9: 3870

Sodium chloride–sodium fluoride systems (liquid)
corrosive effects on Ti, 9: 1255(J)

Sodium chloride–sodium systems
equilibrium compositions in, 9: 2154(J)

Sodium chloride–water systems
corrosive effects, 9: 3459

Sodium chlorides
coloration and luminescence of, radiation-induced, 9: 4314(J)
emission, excitation, and absorption spectra of Ag-activated, 9: 3116(J)
energy loss of 22-kev electrons, 9: 1665(J)
sintering, 9: 4777(R)
solubility in liquid Na, 9: 4702
specific heat of, 9: 237(J), 6212(J)
vapor pressure lowering of water by addition of, 9: 524(J)

Sodium chlorides (liquid)
corrosion and polarization studies of Cu, Cu alloys, Ni, Ni alloys, titanium and brass in 3%, 9: 2259(J)

Sodium chromate–sodium bromide systems
polarization of Mg and Mg alloys in aqueous, 9: 5051(R)

Sodium chromate–sodium chloride systems
corrosion and polarization of Mg and Mg alloys in aqueous, 9: 5051(R)
corrosive effects of Mg and Mg alloys, 9: 3870

Sodium chromates
corrosion-inhibition properties of mixture of chloramine and, 9: 153

Sodium compounds
polarographic behavior of, in molten ammonium formate, 9: 7292

Sodium dichromates
(See Sodium chromates.)

Sodium electrodes
properties of, and use as a neutral electrode in the electrochemistry of molten salts, 9: 4932(J)

Sodium fires
ignition of sodium alloys at temperatures from 600 to 800°C, 9: 5590
prevention, 9: 4179(R)

Sodium fluoborate–hydrofluoric acid systems
phase studies, 9: 2614

Sodium fluoride–hydrofluoric acid systems

phase studies, 9: 2614

Sodium fluoride–lithium fluoride–potassium fluoride systems

thermal capacity and enthalpy, 9: 634(R)

Sodium fluoride–potassium fluoride systems

relative position in the electrochemical series of Al, Mn, Cr, and Ni dissolved in, 9: 6310(J)

Sodium fluoride–sodium chloride systems (liquid)

corrosive effects on Ti, 9: 1255(J)

Sodium fluoride–sodium systems

equilibrium compositions in, 9: 2154(J)

Sodium fluoride–uranium systems

preparation, 9: 927(J)

Sodium fluoride–uranium(IV) fluoride systems

magnetic susceptibilities of UF_4·NaF, UF_4·3NaF, and (γ)UF_4·2NaF, 9: 7737(J)

Sodium fluoride–zirconium fluoride systems

decomposition potentials, 9: 7279(J)

Sodium fluoride–zirconium fluoride–zirconium oxide systems

decomposition potentials, 9: 7279(J)

Sodium fluorides

absorption of F_2 by, 9: 3082

absorption spectra of irradiated, 9: 6868

sintering of, 9: 653(R), 2702(R)

U-activated, fluorescence, 9: 5624(J)

Sodium formates

potentiometric titration of, in formic acid with an H electrode, 9: 523(J)

Sodium graphite reactors

design, 9: 755(J), 3293(J)

SRE core design and construction, 9: 5502(J)

Sodium halide–sodium hydroxide systems

constitution diagrams and electrolysis, 9: 5251(J)

Sodium hydrides

heats of formation and hydrolysis, 9: 2333

preparation in NaOH, and chemical properties, 9: 7671

solubility in liquid Na, 9: 4702

toxicity, 9: 4054

Sodium–hydrogen systems

dissociation pressures of H in Na–NaH–H systems at 500° to 600°C, 9: 3774(J)

Sodium hydroxide–sodium halide systems

constitution diagrams and electrolysis, 9: 5251(J)

Sodium hydroxides

infrared spectra at room and liquid-air temperatures, Raman spectra at room temperature, and crystal structure, 9: 3434

infrared spectra of D-labeled, at room and liquid-air temperatures, 9: 3434

Sodium hydroxides (liquid)

corrosive effects on metals and alloys at 1000 and 1500°F, 9: 1508

corrosive effects on Ni containers, 9: 951(J)

density of, from 447° to 736°C, 9: 3386

reactions with Be, Cr, Cu, Fe, Mn, Monel, Ti, and Ta, 9: 1466(R)

water vapor pressure determination over, 9: 4708(J)

Sodium iodide crystals

detection of photoneutrons with, 9: 3944(J)

escape peak corrections for iodine K x radiation from, 9: 312(J)

fluorescence and thermoluminescence in x-irradiated, 9: 3682(J)

Sodium iodide crystals (cont'd)

gamma-ray absorption and pulse height distribution, 9: 4534(J)

luminescence of unactivated and Tl-activated, effects of α, γ, and ultraviolet radiations on, 9: 5109

preparation and properties, 9: 1597

response of, effect of temperature on, 9: 7456

response of thallium-activated, to fission fragments, 9: 1606(J)

thallium activated, cosmic-ray bursts in, near sea level, 9: 676(J)

thallium activated, fluorescent response of, to nuclear radiations, 9: 1043(J)

thallium activated, ionization energy loss of mesons in, 9: 708(J)

Sodium iodide–sodium systems

equilibrium compositions in, 9: 2154(J)

Sodium iodides

dispensing apparatus for tracer doses, 9: 5286(J)

scintillation response of, to photons, 9: 6868

thallium activated, scintillation response of, at low particle energies, 9: 707(J)

Sodium ion beams

electron loss by 80- to 250-kev, effective diameter, 9: 7564(J)

Sodium ions

activity measurements with resin membrane electrodes, 9: 2149(J)

adsorption at ionic strength of 10^{-2}N and 10^{-3}N, 9: 4980

adsorption on quartz, 9: 3111(R)

adsorption on quartz, effect of pH, 9: 623(R)

conductometric determination of, in paper chromatograms, design and performance of apparatus for, 9: 2215(J)

elution behavior of, from sulfonic acid resins, 9: 5298(J)

transfer through mucosa of normal and artificially constructed bladders, tracer study, 9: 1732(J)

Sodium isotopes Na^{22}

capture-positron branching ratios, 9: 1674(J)

decay, 9: 6530(J)

electron capture at very low energy, 9: 2961(J)

electron capture in decay of, 9: 6697(J)

energy levels and excitation energies, 9: 4205(R)

K capture to positron ratio of, 9: 1672(J)

in measurements of total exchangeable Na and K, 9: 4696(J)

nuclear magnetic moment of, calculated by proton-neutron coupling, 9: 742(J)

production of, by 0.4- to 3.0-Bev proton bombardment of Al, cross sections for, 9: 6074(J)

spectra, 9: 1133

Sodium isotopes Na^{23}

activation determination, biological applications of, 9: 1650(J)

Coulomb excitation functions and energy levels for, bombarded with 3.5-Mev α particles, 9: 423(J)

deuteron reactions (d,d), 9: 1066(R)

gamma reactions (γ,α2p), N^{17} yield curve from, 9: 3644

nuclear quadrupole moment of, by atomic beam resonance method, 9: 4555(J)

neutron reactions (n,2n), cross section for, 9: 4281(J)

neutron total cross sections, 9: 988(R)

nuclear electric quadrupole moment, 9: 2903(J)

proton reactions (p,α), α angular distributions from, 9: 1646(J)

proton reactions (p,γ), 9: 2454(J)

proton reactions (p,γ), angular distributions and angular correlations in, 4874(J)

proton reactions (p,γ), γ rays from, 9: 764(J)

Sodium isotopes Na^{23} (cont'd)

proton reaction (p,n), threshold value in, 9: 7551(J)

thermonuclear reactions of protons with, in stars, 9: 3647(J)

Sodium isotopes Na^{24}

absolute standardization by coincidence methods, 9: 6112(J)

determination of, in body fluids, simultaneously with determination of K^{42}, 9: 1465(J)

gamma penetration in H_2O and Hg, 9: 6783

gamma radiation from, counting in the presence of K^{42}, 9: 2429(J)

half life, 9: 2960(J)

production of, by 0.4- to 3.0-Bev proton bombardment of Al, cross sections for, 9: 6074(J)

quantitative determination of γ radiation from internally deposited, in humans, 9: 3591(J)

radium equivalent of γ source of, 9: 3657(J)

Sodium isotopes Na^{25}

beta transformation and activity of, 9: 6540(J)

gamma spectra, 9: 5537(J)

Sodium–lithium alloys (liquid)

activity coefficients and phase studies, 9: 172

Sodium niobates

preparation of Na_3NbO_4, 9: 7287(J)

Sodium nitrate–silver nitrate–water systems

activity coefficients at 25°C, 9: 3795(R)

Sodium nitrates

absorption spectrum of, exposed to ionizing radiation, 9: 2665(J)

effect on the vapor tension and calorimetry of 100% and aqueous solution of nitric acid, 9: 2140(J)

perpendicular bending frequency in, N^{15} isotope shift, 9: 919(J)

radiolysis of aqueous solutions, 9: 7718(J)

Sodium nitrates (liquid)

corrosive effects of, on steel, 9: 7755

Sodium oxide–silicon oxide–zirconium oxide systems

physical and chemical properties and crystallography of phases in, 9: 2138(J)

Sodium oxide–uranium(VI) oxide–water systems

equilibrium phase relations in, 9: 58

Sodium oxides

solubility in liquid Na, 9: 5647(J)

solubility in liquid Na, effects of K on, 9: 4175(R)

solubility in liquid Na, effects of K and Hg on, 9: 5657(R)

vapor pressure, 9: 4716(J)

Sodium phosphates

chain branching in, dependence on Na/P ratio and rate of degradation at 25°, 9: 3772(J)

Sodium–potassium alloys

determination of O_2 in, with butyl bromide, 9: 7700(J)

thermodynamic properties, 9: 2735(R)

Sodium–potassium alloys (liquid)

circulation systems, instrumentation, 9: 4179(R)

corrosion of Zr and stainless steel and analysis of, 9: 1254

corrosive effects on electrical insulating materials, 9: 4179(R)

equilibrium solubility of Fe in, equipment and procedures for studying, 9: 3501

fluid flow in annuli and heat transfer coefficients between, 9: 6251(J)

friction factor, effects of Reynolds Number on, 9: 4179(R)

handbook, 9: 6664

heat and mass transfer, 9: 6999(R)

Sodium–potassium alloys (liquid) (cont'd)

heat transfer in cross-flow heat exchanger, 9: 6247

heat-transfer properties and electrical resistance, 9: 4179(R)

heat-transfer systems, description and operation, 9: 6953

sampling, 9: 4179(R)

viscosity, 9: 1277(J)

wear of stainless steel bearings in, 9: 2280

wetting of surfaces with, heat transfer in, 9: 4175(R)

Sodium salts

deposition in steam-generating pipes, 9: 3449(J)

Sodium silicate glass

thermal conductivity, 9: 946(R)

wetting of Ti, W, Ta, Pt, Mo, Fe, and Au with, 9: 6646(R)

Sodium–sodium bromide systems

equilibrium compositions in, 9: 2154(J)

Sodium–sodium chloride systems

equilibrium compositions in, 9: 2154(J)

Sodium–sodium fluoride systems

equilibrium compositions in, 9: 2154(J)

Sodium–sodium iodide systems

equilibrium compositions in, 9: 2154(J)

Sodium sulfates

concentration of O^{18} in water of crystallization, 9: 2267(J)

Sodium systems

liquid, reaction at high temperatures between air and, 9: 7033(J)

Sodium–tin alloys

electrochemical properties, 9: 7361(J)

Sodium uranates

formation, 9: 3438(J)

Sodium vanadates

absorption spectra of, application to determination of V, 9: 86(J)

Soils

(See also Ground.)

capillary conduction of ground water in, 9: 236(J)

contamination and fission product uptake of, in atomic explosions or reactor accident, 9: 7283(J)

dispersion of saline solutions in, studied by P^{32}, 9: 6644(J)

fission-product contaminated, analysis, 9: 534

Soldering

(See also Brazing; Welding.)

friction-tinning technique of, metals and ceramics, 9: 7818(J)

Solid solutions

(See also Constitution diagrams.)

enthalpy change and strain energy in formation of, 9: 187

properties, x-ray and thermodynamic studies of, 9: 4458(R)

relaxation effects in, arising from changes in local order, 9: 204(J)

relaxation strength of, theory, 9: 1537(J)

thermodynamic properties, diffusion method of determining, 9: 7394(J)

Solid state reactions

tracer techniques, 9: 6554(R)

Solids

assay of β radioactivity in thick, 9: 5444(J)

chemical effects of ionising radiation in, survey of published work on, 9: 6614(J)

disordering of, by neutrons, theory, 9: 4014(J)

equation of state, corrections in thermodynamic functions, 9: 5697

Solids (cont'd)
fluidization effects of agitation, 9: 2235(J)
fracture of, 9: 644(J)
heat capacity of, effect of particle size on, 9: 5277(J)
heat transfer film coefficient for water suspensions in turbulent flow containing, of high thermal conductivity, 9: 2236(J)
irradiation, chemical effects of, 9: 6108(J)
melting, theory, 9: 7387
nature of, research programs on, 9: 6288
nuclear magnetic resonance saturation and rotary saturation, 9: 5774(J)
physics of, 9: 2338(J)
positron annihilation in, angular correlation of photons, 9: 6766(J)
radiation damage by high-energy particles, theory, 9: 7951
self-diffusion and chemical change in, using an emanation method, 9: 7280(J)
self-diffusion in, by surface activity method, 9: 5248
separation and concentration of, 9: 6232(J)
x-ray-diffraction analysis of surface properties, 9: 186
Young's modulus of, apparatus for measuring, 9: 6718(J)

Solubility
(See also Heat of solution.)
equipment and procedures for studying, of metals, 9: 3501
methods of measurement, 9: 3068
of solids in nonpolar liquids, effects of pressure on, 9: 4718(J)

Solutions
aqueous, effects of α radiation, 9: 580(J)
critical point measuring equipment and techniques, 9: 513
fluorescent behavior of organic, upon irradiation, 9: 4316(J)
photochemistry, 9: 6868
of protein, cystine, and thymonucleic acid, effects of x and ultraviolet radiation, 9: 5291(J)

Solvent extraction processes
mass transfer in horizontal liquid-liquid extraction tube, 9: 2208
plant design, 9: 7154(J)
power requirements for pulse generators in liquid-liquid extraction columns, 9: 5301(J)
pulsation application to liquid-liquid extraction, 9: 5300(J)
for reactor fuels, techniques and estimated costs, 9: 3289(J)
review, 9: 3105(J)

Solvents
mixed, determination of thermodynamic equilibrium constants in, 9: 869(J)
organic, coulometric determination of trace amounts of water in, 9: 5259
organic, fluorescent behavior of, upon irradiation, 9: 4316(J)
rigid, atoms and radicals trapped in, 9: 5612(J)
swelling of resins in mixtures of water and methanol, ethanol, isopropyl alcohol, and dioxane, 9: 1750(J)

Sonic inspection
(See also Ultrasonics.)
of adhesive bonded sheet metal, techniques and equipment, 9: 1263(R)
equipment for, of Zr and Zr alloys, 9: 4167

Sound
applications in analysis of binary gas mixtures, 9: 4085(J)
dispersion of, solution of linearized equations in thermal relaxation of gases, 9: 3240(J)

Sound (cont'd)
scattering of, from randomly uneven surface, 9: 1284(J)

South Carolina
map of geophysical exploration of Edisto Island Area in Berkeley, Charleston, Colleton, and Dorchester Counties, 9: 1833(J)

South Dakota
coal deposits, map of, 9: 5332(J)

South Dakota (Custer Co.)
geology, mineralogy, and petrology of High Climb Pegmatite in, 9: 3836(J)

South Dakota (Fall River Co.)
map showing U deposits in Edgemont District in, 9: 7341(J)

South Dakota (Harding Co.)
geochemistry and mineralogy of uraniferous lignite in Mendenhall Strip Mine in, 9: 5002(J)
geologic map of Bar H Area in, 9: 5336(J)
geologic map of Cave Hills and Table Mountain Areas in, 9: 5333(J)
geologic map of Slim Buttes Quadrangle in, 9: 5334(J)
geologic map of southern part of Slim Buttes Area in, 9: 5335(J)
stratigraphy of U-bearing lignites in Mendenhall stripping site in, 9: 622(R)
uraniferous lignite deposits in, 9: 7758

South Dakota (Lawrence Co.)
exploration of Bald Mountain Mining District in, 9: 165(J)

South Dakota (Pennington Co.)
exploration of White River Badlands in, 9: 3158(J)

Southam Group (Nev.)
geology and U occurrence, 9: 6963

Southern Research Inst., Birmingham, Ala.
progress reports on development of a particle counter, 9: 3775(R)
progress reports on particle-size distribution of aerosols, 9: 2357(R)

Southwest Research Inst., San Antonio
progress reports on development of aromatic compounds for lubricants, 9: 5626(R)
progress reports on polynuclear aromatic compounds for high temperature lubricants, 9: 517(R), 4108(R)

Spallation
(See also appropriate subheadings under specific isotopes and materials.)
of copper, La, and Bi by 480- and 660-Mev protons, cross sections, yields, and productry, 9: 7939(J)
empirical cross-section formulas for medium-weight elements, 9: 3982(J)

Spallation products
(See also Fission products.)
of copper, from 90-Mev protons and neutrons and 190-Mev protons and deuterons, 9: 6075(J)
from deuteron, proton, and α bombardment of Ag, cross sections and yields, 9: 7940(J)
from deuteron and proton bombardment of Cu and Bi, yields and cross sections, 9: 7938(J)

Specific heat
temperature dependence of, effect on computational method of balances, 9: 4985
of liquid He^3, temperature dependence of, 9: 5714(J)
of lithium fluoride, sodium chloride, and zinc sulfide at low temperatures, 9: 6212(J)
of solid bodies, theory, 9: 237(J)
of solution of He^3 in liquid He^4, 9: 5715(J)

Spectra

(See also specific spectra, e.g., Absorption spectra; Neutron spectra.)

Coulumb interactions, influence of, 9: 5404

arc discharge, characteristics of, 9: 6358(J)

excited by spark discharge, brightness of lines in, 9: 6356(J)

excitation by electric discharge, 9: 6355(J)

isotopic shift calculations in He, 9: 6387(J)

line broadening by electrons, theory, 9: 5540

line broadening causes, 9: 7581(J)

line width, effects of electron collisions on, 9: 5820(J)

lines in, collisonal broadening of, 9: 7958(J)

Spectrometers

(See also specific spectrometers, e.g., Beta spectrometers; Microwave spectrometers.)

automatic direct reading, for analysis of metals, electronics in, 9: 3948(J)

Cine, five-track spectrograph, design, 9: 284(J)

computation of absorption peak location in, 9: 5707(J)

design and performance of nuclear magnetic resonance, for quantitative analysis by nuclear magnetic adsorption, 9: 2678(J)

design of recording high-sensitivity paramagnetic resonance, 9: 2391(J)

leak detection with, 9: 7055

luminosity of prism, grating, and Fabry-Perot, 9: 283(J)

photoelectric cells used in, 9: 6130(J)

rapid-scanning, for direct reading spectrographic analysis, 9: 2082(J)

resolution of magnetic-particle, 9: 449

resolution of spiral-orbit, 9: 3966(R)

scintillation, for coincidence events, 9: 7868(J)

scintillation, for study of low-energy bremsstrahlung spectra, design, 9: 3260(J)

scintillation, performance and statictics, 9: 7103(J)

scintillation, stabilizing with counting-rate-difference feedback, 9: 7457(J)

scintillation pair, development, 9: 2099(R)

spiral orbit, 9: 6035(R)

strong focusing, for detection of Bevatron K mesons, 9: 6023(J)

Spectrophotometers

photometric titration assembly for, 9: 4081(J)

sensitive in the wave-length region of 0.3 to 2.6 μ, design, 9: 916

Spectrophotometry

(See also Calorimetry.)

of chromatographed cobalt and copper on paper, 9: 6422(J)

of microörganisms and living tissues, design of cuvettes for, 9: 7693

of soluble solid mixtures and substances on chromatograms by differential measurements of reflectance, 9: 3395(J)

Spectroscopy

(See also such headings as Beta spectroscopy; Mass spectrography.)

background correction in, mechanical calculator for, 9: 4087(J)

cathode vacuum discharge application to, 9: 7047(J)

five-track spectrograph, design, 9: 284(J)

of heavy elements, in UO_2, 9: 4074

magnetic and electric deflection, for observation of recoils in neutrino emission from A^{37}, 9: 2078(J)

manual on, used routinely at Arco Chemical Plant, 9: 6896

nuclear, general discussion of, 9: 6446(J)

Spectroscopy (cont'd)

optical properties of atomic vapors near resonance, 9: 6370

photoelectric techniques and equipment for isotopic, 9: 4640(J)

photographic emulsion calibration by a modified step-sector method, 9: 4970

Stark effect broadening of higher Balmer lines of H, 9: 450(J)

transformation coefficients between LS and jj coupling, tables, 9: 748

Sperm

effects of total-body irradiation on, in mice, 9: 5217(J)

human, motility and morphology, effects of irradiation, 9: 5224(J)

induction of recessive lethals in Mormoniella, effects of radiation on, 9: 5846(J)

Spermatogenesis

(See also Gonads.)

effects of total-body irradiation on, in mice, 9: 5217(J)

reunion of chromosomes irradiated during, in Drosophila, 9: 7235(J)

Sphalerites

adsorptive and desorptive properties of, 9: 3111(R)

adsorption of Cu ions, 9: 4980

adsorptive properties of, on sphalerite, effect of ammonia concentration, 9: 623(R)

oxidation of, kinetics, 9: 3381

Spheres

bending and buckling of shells, nonlinear theory, 9: 7739

solid angle calculations, 9: 7853

thermal shock analysis, 9: 1497(J)

Spinal cord

intact, effects of irradiation on, in monkeys, 9: 4354(J)

Spleen

biochemical activity, effects of whole-body x irradiation in rats, 9: 3738(J)

desoxyribonuclease activity of, effects of total-body x irradiation on, in rats, 9: 488(J), 7242(J)

effects of x radiation on, in mice, 9: 1723(R)

effects of x irradiation on weight of, in mice, 9: 7240(J)

enzyme systems, effects of total-body x irradiation on, in rats, 9: 2120(J)

extracts of, radiosensitivity effects, 9: 3033

homogenates, protective effects against radiation injuries in mice, 9: 2596(J), 2600(J)

homogenates of, effects of injected, on adenosine triphosphatase activity, spleen weight, and leukocyte count in irradiated mice, 9: 38

homogenates of, protective effects against radiation injuries in mice, effects of storage, 9: 2594(J)

protection against radiation injuries, 9: 2547(R)

radiation injuries in mice, effects of homogenates on, 9: 3370

radiation-recovery factor from, of mice, 9: 3748(R)

radiosensitivity, 9: 6820(R)

radiosensitivity of, in mice, 9: 2547(R)

role of, in recovery from radiation injury, in mice, 9: 7626(J)

shielding of, during irradiation, effects on susceptibility to infection in mice, 9: 5581(J)

therapeutic effects on radiation injuries, 9: 837(J)

Spontaneous fission

of curium, Cm^{244}, average number of neutrons for, 9: 6073(J)

fission yields in, of Cf^{253}, 9: 3633(J)

half lives, correlation with α-decay half lives, 9: 362(J)

Spontaneous fission (cont'd)
of thorium, half life, 9: 5187(J)
Spray columns
absorptive properties, 9: 7692
Sprays
bibliography on, 9: 1738
Sputtering
high-vacuum, radiation damage theory, 9: 3898(J)
mechanism of, electron microscope study, 9: 2743(J)
Stable isotopes
abundance ratios, determination by infrared gas analysis, 9: 5713(J)
applications, an eight-year summary of, 9: 7062(J)
chemistry, book review, 9: 5305(J)
properties, separation, and availability, 9: 6389(J)
Stack disposal
(See also Meteorology; Radiation; Smokes.)
chimneys to control down-wash of gases, design, 9: 2688(J)
dosage calculations for radioactive clouds formed by sudden fission product release in, 9: 2700
experimental stack for use in studies on, design of, 9: 4263(J)
filtration of radioactive aerosols from, by glass fibers, 9: 1491(J)
of gases from Raleigh reactor, meteorological factors, 9: 3978
iodine removal by scrubbers, stack monitoring system for checking, 9: 7854
meteorological factors affecting, 9: 7492
Stainless steel
analysis by x-ray fluorescence, 9: 6896
argon-arc welding of, in British atomic factories, 9: 5975(J)
brazing, 9: 5066
brazing of, with B–Ni–Cr systems, 9: 1886(J)
cladding of, by Ti with Cr, Co, Fe, Mo, and Ni, as bonding agents, 9: 4182
colorimetric analysis of, for Co by the tetraphenylarsonium method, 9: 2162
compressive, bearing, and shear creep-rupture properties of, at elevated temperatures, 9: 5361
corrosion, loop testing, 9: 6477
corrosion and thermal fatigue, 9: 1541(J)
corrosion by Bi–Pb–Sn alloy at elevated temperatures, 9: 6659
corrosion by chlorinated and alkalized boiler water and pure deionized water, 9: 3168
corrosion by liquid U–Bi alloy, 9: 3285
corrosion by nitric oxide at high temperature, 9: 6308(J)
corrosion in 1000°F liquid Na, effect O_2 on, 9: 948
corrosion in high temperature waters, 9: 3459
corrosion in HNO_3–$K_2Cr_2O_7$ solution, 9: 1885(J)
corrosion in water and aqueous media at 600 and 680°F, 9: 1822
corrosion of AISI 347 and 321, by alternate exposure to liquid and gaseous fluorine, 9: 4142
corrosion of, and stainless steel–Zn and Al–stainless steel couples by H_2O, inhibition with Na dichromate-chloramine mixtures, 9: 153
corrosion of, by wet and dry Cl_2 between 260 and 300°, 9: 158(J)
corrosion of, effect of O on, 9: 5647(J)
corrosion resistance, welding, and annealing of type 329, 9: 7017(J)
corrosion testing, methods for cleaning exposed specimens for, 9: 952(J)
coupled to Ti, galvanic corrosion in H_2SO_4 solutions, 9: 3151(J)
creep, effects of composition and structure on, 9: 4455
Stainless steel (cont'd)
creep and fatigue of, effects of grain size on, 9: 4184
creep properties under intermittent heating, 9: 5664
cutting with air-carbon arc process, exploratory results on, 9: 213(J)
descaling methods for, corroded by high-temperature water, 9: 154
determination of relation of ferrite content to magnetic properties, 9: 3877(J)
ductility, hardness, and rupture of, effect of B, Ti, W, and Zr additions on, 9: 3502(R)
effect of chlorides on, 9: 6648(J)
fatigue strength of spot-welded, effects of prestressing on, 9: 2315(J)
fatigue life of, for hydraulic systems, 9: 6641
fatigue strength of, 9: 214(J)
fatigue tests of seam-welded, 9: 3500
ferromagnetic saturation induction of small specimens of apparatus for measurement, 9: 3877(J)
galling, 9: 3843(R)
high-manganese, corrosion resistance to boiling HNO_3 and H_3PO_4 and ductility, 9: 7379(J)
impregnation of bearings of, with Teflon, use in water, 9: 6267(J)
inert-gas welding of, for aircraft parts, 9: 6301(J)
intercrystalline corrosion, due to aging, 9: 4143(J)
intergranular oxidation, measurement, 9: 4185
machining and grinding, 9: 4174
mass transfer and corrosion by liquid NaK and Na and microstructure, 9: 1254
mass transfer by liquid Na at 400 to 1000°F, 9: 4179(R)
mass transfer by liquid Na in loops of, inhibition, 9: 4175(R), 5657(R)
mass transfer in irradiated loops circulating liquid Na, measurement, 9: 4179(R)
mass transfer of components in liquid Na at 925°F, effects of O_2 on, 9: 3827
mass transfer of radioactive constituents in Na, inhibitors to, 9: 6958
metallurgical aspects of welding precipitation-hardening, 9: 2314(J)
metallurgy and development, 9: 7377(J)
microstructure, from 80° to 1650°F, 9: 4464(J)
performance of equipment made of, effect of design, fabrication and installation on, 9: 1541
polarization, corrosion, and erosion-corrosion in fuming nitric acid from room temperature to 160°F, design and performance of equipment for testing, 9: 2255(J)
polishing of, with alumina abrasives, technique, 9: 3879(J)
powder metallurgy and mechanical properties, 9: 6666
properties and reactor applications, 9: 6476
radiation effects, 9: 6254
remotely controlled heliarc welding device for joining tubes of, design, 9: 631
riveted and welded joints of, creep and creep-rupture characteristics, 9: 5356
shrink fitting, effect of fabricating techniques on, 9: 3196(J)
spot-welded joints in, behavior in fatigue, 9: 5340(R)
specific heat and enthalpy of types 347 and 446, 9: 2308(J)
stress-corrosion, 9: 3540(J)
stress-corrosion cracking of, general discussion of, 9: 6266(J)
stress-corrosion of auxiliary boilers of, 9: 3145
stress-corrosion of, in high-temperature water, 9: 4782
stress-corrosion of, mine-sweeper boilers, 9: 5947
stress-rupture and fatigue characteristics, effects of ceramic coatings on, 9: 4137(R)

Stainless steel (cont'd)
stress values of 304, 316, and 347, chart and nomograph for, 9: 3441(J)
surface protection of, during heat treatment, 9: 5071(J)
tensile properties of, effect of structure, composition, and cold working on, 9: 2727(R)
thermal shock in NaK, design and performance of apparatus for testing, 9: 5638
tracer diffusion of iron in, 9: 7015(J)
wear in NaK, heptane, and hexadecane, 9: 2280
welded joints of, with copper–nickel alloys, thermal rupture, 9: 1264
welding, effects of alloying elements on, 9: 1888(J)
welding, equipment for, 9: 3514, 3515
welding, qualification tests on modified type 347 stainless steel electrodes for, 9: 2734
welding and heat treatment of pipes of, 9: 1279(J)
welding of, and mechanical properties of welded, 9: 1860
welding of, effect on ferrite content, 9: 3864
welding of, for 1100°F turbine operation, 9: 3528(J)
welding of, in atmosphere of N, NO_2 formation during, 9: 629
welding of tubes to sheet, 9: 632
welding Type 347, for 1100°F turbine application, 9: 5372(J)
welds, static and fatigue properties, 9: 5370(J)
Stainless steel (austenitic)
ductility of AISI 303 and 310, effects of strain rate and temperature on, 9: 181
ductility of 316 and 347, device for testing and results, 9: 4197(J)
elastic modulus, changes in, during irradiation in pile of, 9: 6509(J)
high-manganese, properties, 9: 3543(J)
intergranular corrosion, effect of minor constituents on, 9: 1509
magnetic properties and microhardness of tensile-stressed, 9: 181
metallurgical properties for high-temperature use, 9: 7381(J)
properties of, at elevated temperatures, 9: 3882(J)
stability of type 347, effects of neutrons on magnetic techniques for investigating, 9: 3877(J)
welding to AMS 6415 low-alloy steel, 9: 1840
Stainless steel (ferritic)
properties of, at elevated temperatures, 9: 3882(J)
Stainless steel–aluminum couples
polarization, corrosion, and erosion-corrosion of galvanic, in fuming nitric acid from room temperature to 160°F, design and performance of equipment for testing, 9: 2255(J)
Stainless steel compacts
corrosion of, effect of sintering atmosphere on, 9: 2754(J)
sintering of, in H and dissociated NH_3, 9: 2754(J)
Stainless steel–titanium couples
electrochemical corrosion, 9: 1838(R)
Stalin's Present Mine (Nev.)
geology and U occurrence, 9: 6963
uranium distribution, 9: 1260(J)
Standard Oil Co. of Ind., Chicago
progress reports on development and evaluation of high-temperature greases, 9: 1814(R)
Standards
radium source, comparison of Canadian to U. S., 9: 7577(J)
use of plastic in preparing, 9: 2387(J)
Stanford Research Inst., Calif.
progress reports on thermodynamic properties of molten salts, 9: 2792(R), 5247(R)
Stanford Research Inst., Calif. (cont'd)
progress reports on viscosity of organosilicon compounds at high temperatures, 9: 5381
Stark effect
broadening of higher Balmer lines of H, 9: 450(J)
perturbation of atomic energy levels by nonuniform Coulomb fields, 9: 2079(J)
in plasma, 9: 5404
Stars
(See also Sun.)
novae, relation to cosmic radiation origin, 9: 5689(J)
radiation flux field outside of, calculations of, 9: 6687(J)
thermonuclear reactions involving protons on light nuclei, 9: 3647(J)
Statistics
(See also Biometry; Mathematics.)
application to chemistry and chemical engineering, review, 9: 3249(J)
bibliography on linear programming and game theory, 9: 4847
of economics of sampling, 9: 79
efficiency of the sample median for populations of finite variance, 9: 3586
in industrial sampling, lectures on, 9: 4238
moments of the sample median, 9: 3585
rank correlation method in, 9: 2846(J)
rapid methods for data analysis, 9: 2844
techniques for failure testing of manufactured units, 9: 942
theory of mass behavior, 9: 3921(J)
in thermodynamics of isotope effects, 9: 1418
two-sample procedures in simultaneous estimation, 9: 5418
Steam
(See also Water vapor.)
condensation on plane surface of flowing, 9: 4135(J)
contamination measurement by radioisotopes, 9: 7743(J)
separation from water, efficiency of efferent vertical centrifugal steam separators for, 9: 7741(J)
Steam engineering
radioisotope application to stream purity determination, 9: 2696(J)
3000-Kw steam generator for SIR, design and testing, 9: 4175(R), 5657(R), 6699(R)
Steam generators
(See Boilers.)
Supersonic inspection
(See Sonic inspection.)
Steam power plants
application of liquid metals to reheating in steam turbine plant, 9: 3443
performance of Na-heated, 9: 3443
Steam–water systems
deposition of salts and temperature distribution in steam-generating pipes, 9: 3449(J)
structure, investigation of, by means of radioisotopes, 9: 7743(J)
Stearic acid
wetting properties, 9: 6246(R)
Steatites
thermal fracture under quasi-static thermal stresses, 9: 1506(J)
thermal shock resistance, 9: 142

Steel

(See also Boron steel; Carbon steel; Chromium-nickel steel; Chromium steel; Molybdenum steel; Nickel steel; Niobium steel; Silicon steel; Stainless steel.)

alloy, hard-facing with electric arcs, control measures in, 9: 220(J)

alloy and special, recent progress in, review, 9: 2301(J)

aluminum oxide coated, corrosion resistance to, 9: 191

analysis, simultaneous determination of Cr, Nb, and Mo in, 9: 3435(J)

analysis for small amounts of Al by spectrochemical method, 9: 2171(J)

austenitic, with Fe, Mn, Cr, C, N, Mo, and V, preparation and properties, 9: 3488(R)

biaxial fatigue properties of high-strength pressure-vessel, 9: 4196(J)

boundary lubrication of, with halogen-substituted methane and ethane gases, 9: 4979

branding rolled, industrial use of isotopes for, 9: 7806(J)

cast, for high-temperature plant, effect of additions, 9: 3880(J)

chromium–molybdenum, arc-welding of, used at high temperatures and high pressure, 9: 7363(J)

coating with Ni, inspection by radioautographic techniques, 9: 147

contamination by refractory materials, 9: 7753(J)

corrosion, development of coating and pretreatment for inhibition of, 9: 947(R)

corrosion, welding, and mechanical properties, review, 9: 7368(J)

corrosion by Li–Pb–Sn alloy at elevated temperatures, 9: 6659

corrosion by hydraulic fluids, 9: 2795(R)

corrosion by liquid sodium nitrate, effects of high-level γ radiation on, 9: 7755

corrosion and welding of metal coated, 9: 171

corrosion by water, inhibition with Na dichromate-chloramine mixtures, 9: 153

corrosion of, protective action of pigments on, 9: 2258(J)

corrosion prevention of, by metal spraying, 9: 3150(J)

corrosion testing, methods for cleaning exposed specimens for, 9: 952(J)

creep, stress-rupture, hardness, and crystal structure of, containing Cr–Mo–Ti–B, 9: 986(J)

creep and hardness of, effects of impurities and imperfections on the, 9: 970

creep-resisting, mechanical properties of, for use in steam power plants, 9: 4468(J)

damping and elasticity properties, 9: 7746

descaling methods for, corroded by high-temperature water, 9: 154

diffusion of carbon in, investigation with C^{14}, 9: 4203(J), 7792(J)

drip-free cementation, scale-free heating, and design of vibrator-tube furnace for continuous heat treatment of, 9: 1891(J)

ductility of SAE 1020, with different amounts of H_2, 9: 2285

ductility, temperature effects, and tensile properties, toughening of high strength, by warm working, 9: 6998

effect of chlorides on, 9: 6643(J)

electroplating with Ti, 9: 4183

endurance limit, 9: 5056

etching by ionic bombardment, 9: 1280(J)

fatigue, equipment for testing, 9: 2238

fatigue and heat treatment of SAE 1018, 9: 6287

fatigue and stress, 9: 4159

fatigue and tensile properties, anisotropy of, in bending and in torsion, 9: 4158

fatigue of ductile, at ranges of stress extended to compression, 9: 5962

fatigue properties of pressure vessel, effect of welding, notches, attachments, and fabrication on, 9: 1689(J)

Steel (cont'd)

fatigue strength of, 9: 214(J)

fatigue under ranges of stress, 9: 4157

ferritic, diffusion of hydrogen in, 9: 3191(J)

flash welding of, mathematical analysis of temperature distribution during, 9: 5373(J)

fretting corrosion, effect of clamping pressure on, 9: 6262

hardening, deformation, and decomposition, 9: 7807(J)

hardening by addition of B, mechanism of, 9: 3857(R)

heat-resisting, development, 9: 7377(J)

heat treatment, controlled atmospheres for, 9: 6279

high-vacuum melting and casting, 9: 195(J)

hot-hardness testing of W–Cr–V and W–Cr–V–Co tool steel and Cr–W die steel, 9: 3860

hot-hardness testing of W–Cr–V and W–Cr–V–Co tool steels and Cr–W and Cr–C die steels in liquid NaK, 9: 3507

hot-tension and weld-metal cracking tests of filler-wire and base-metal compositions of, 9: 3494(R)

hydrogen embrittlement, effects on tensile strength and fatigue properties of plated and unplated high-strength, and effects of variables on, 9: 2297

hydrogen embrittlement in, 9: 4812(J)

hydrogen penetration, prevention by air injection, 9: 7811(J)

hydrogen removal from plated and unplated high-strength, 9: 2297

low-alloy, spheroidize annealing, 9: 194(J)

low-alloy, welding heavy section of, techniques and requirements for, 9: 222(J)

low-alloy construction, separation of rare earths from, bibliography, 9: 4104

low-carbon, exploratory results of air-carbon arc cutting process, 9: 213(J)

machining and grinding, 9: 4174

mechanical properties and characteristics of quenched and tempered, for pressure vessels, 9: 7364(J)

microstructure and elevated temperature properties of low-alloyed, relations between, 9: 5345

nucleation and growth of graphite in, 9: 96(J)

phase studies and Curie points, 9: 4453

plastic fatigue properties of high-strength pressure-vessel, 9: 4195(J)

quenched and tempered, design of welded pressure vessels using, 9: 7365(J)

quenched and tempered, suitability for pressure vessels, 9: 7366(J)

radiographic inspection, evaluation of Polaroid process for, 9: 143

radiography with Tm^{170}, 9: 2241(J)

roll and electrolytic cladding of Ti on, 9: 3477(R)

rolling friction, 9: 2240(J)

scattering of molecules from surface of, 9: 650

selectivity in formation of fatigue cracks during working of, in corrosive medium, 9: 4811(J)

self-diffusion in, effects of Mn on, 9: 1884(J)

separation and spectrophotometric determination of Ti in, 9: 1199(J)

spectrophotometric determination of Nb in, 9: 4080(J)

strain aging of SAE 1018, influence of, on shape of the knee in the stress-number diagram, 9: 6287

temper brittleness of pressure vessel, 9: 3532(J)

tensile properties and welding, 9: 5663

tensile strength of spheroidize-annealed low-alloy, 9: 194(J)

thick-walled cylinders of, overstrained by internal pressure, behavior, 9: 3453, 5059

thickness and density measurement with radioisotopes, 9: 7805(J)

Steel (cont'd)
titanium in, book on, 9: 7385(J)
torsional properties, effect of temperature and high rates of strain on, 9: 6663
uranium-contaminated scrap, criteria for sale and shipping, 9: 3203(J)
welding of, with high-strength filler metals, 9: 3497(R)
welding of AMS 6415 low-alloy, to austenitic stainless steel, 9: 1840
welding of 20-ft-diam. test tank of, 9: 228(J)
welding procedure qualification tests on 3 pairs of high-strength pressure-vessel, 9: 4198(J)

Steel (clad)
applications and properties, 9: 7383(J)

Sterility
(See also appropriate subheadings under specific radiations and animals.)
x-ray-induced, effects of delayed oviposition on, in Habrobracon, 9: 3736(J)

Sterilization
(See also appropriate subheadings under materials sterilized and under radiations.)
of beef by γ irradiation, nature of odors formed during, 9: 2117(J)
of cheese by γ radiation, 9: 474
economic aspects of the application of soft x rays to food, 9: 6821
of food, induced by exposure to ionizing radiation, review of literature, 9: 2549
of food, induced by γ radiation role of radioresistance of bacterial spores in, 9: 33(J)
of food by γ radiation, 9: 10(R)
of foods and drugs, design and cost of pilot plants using spent MTR fuel rods as radiation sources for, 9: 3122
induced by radiation, utilization of fission products for, 9: 7028
of milk, by exposure to γ radiation, effects on vitamins and enzyme activity, 9: 4919(J)
radiation, food industry's attitude toward, 9: 1714(J)
radiation, of foods and drugs, survey of organizations active in, 9: 1713(J)
radiation, of microörganisms, 9: 7617(J)
radioinduced, by electron traveling-wave linear accelerator, 9: 1369(J)
radioinduced, of food and tissue transplants, 9: 1550(R)

Steroids
biosynthesis of, in isolated calf adrenals, effects of radiation on, 9: 1165(J)

Sterols
metabolism in x-irradiated yeasts, 9: 1170(J)

Stilbene
crystallization from ether, 9: 1473(J)
response to low-energy protons and x rays, 9: 4962(J)

Stilbene crystals
response of, to fission fragments, 9: 1606(J)

Stillwellites
rare earth mineral, occurrence in Queensland, 9: 7338(J)

Stirring apparatus
(See also Mixing.)
use with new polarographic electrode, 9: 5412(J)

Stochastic methods
(See also Mathematics, Monte Carlo method.)
application of age-dependent, to cascade theory, 9: 813(J)
applied to range straggling of heavy particles in matter, 9: 6137(J)
concept of sets enchained by a stochastic process and its use in cascade shower theory, 9: 1688

Storage tubes
(See Memory devices.)

Straight Cliffs Quadrangle (Utah)
photogeologic map of, 9: 3468(J), 5019(J), 5020(J), 5021(J), 5022(J), 6989(J)

Strain gages
(See also Extensometers.)
for cementitious materials, design and performance, 9: 2830
high-temperature, design, 9: 7738
installation procedures for bonded-type resistance wire, 9: 4228
performance at high temperatures, experimental determination, 9: 418
response of iso-elastic, 9: 7822
survey of stress-strain recorders for testing materials, 9: 5637
testing of, for static structural-strain measurements under isothermal conditions, 9: 7430

Stress analysis
(See also Mechanics.)
of circular cylindrical shell, under axial compression, 9: 5942(J)
of cylinders with exponential temperature distribution, 9: 4117
from drilling in pipes and rods, 9: 5965(J)
elastic theory of scabbing in materials with two solids in contact, 9: 5932
of plastic buckling in simply supported plates subjected to nonhomogeneous force distribution, 9: 4121
of fracture and fatigue, 9: 7018(J)
for propagation of elastic and plastic deformation in solids, 9: 7822
relaxation of gasket materials under stress, measurement, 9: 3140
of thin-walled circular cylinders, 9: 933(J)
of welded joints, empirically determined limit curve for, 9: 217(J)

Stress corrosion
(See also appropriate subheadings under specific materials.)
of aluminum bronze bonnets on cylinder valves, 9: 3149(J)
cracking of hardenable stainless steels, general discussion of, 9: 6266(J)
in metals, testing procedures, 9: 5321(J)
testing, theory, uses, influence of stress, environment, specimen orientation, surface area and finish, and time and equipment for applying stress to specimen in, 9: 2256(J)

Strontium
in biological material, estimation by neutron activation analysis, 9: 6203(J)
bone deposition of, in adult rats, tracer study, 9: 5721(R)
bone deposition of, in rats and monkeys, tracer study, 9: 3730(R)
chromatographic separation on cellulose powder, 9: 4105(J)
flame spectrophotometric determination of μg quantities of, in solution, 9: 2639(J)
isotope abundances in certain minerals, 9: 4234(R)
neutron resonances, 9: 1073(J)
spectrographic determination of, in ores and rocks, 9: 162
tissue distribution of, in animals, tracer study, 9: 1156(R)
uptake of, by bean plants, effects of environmental factors, 9: 4056

Strontium carbonate–barium carbonate–rhenium compacts
fabrication of cathodes, 9: 976

Strontium chlorides
diffusion coefficients of, in dilute aqueous solution, 9: 7268

Strontium compounds
hydroxyfluoberyllates, preparation and properties, 9: 5900(J)

Strontium compounds (cont'd)
polarographic behavior of, in molten ammonium formate, 9: 7292
Strontium ions
elution behavior of, from sulfonic acid resins, 9: 5298(J)
Strontium isotopes
concentration and determination of small amounts of, in water, 9: 5604(J)
electromagnetic separation, 9: 1593
fission product, importance in absorption by plants, 9: 5837
Strontium isotopes Sr^{86}
energy levels, 9: 2069(J)
energy levels of, in $Zr^{91} \rightarrow Y^{88} \rightarrow Sr^{86}$ decay scheme, 9: 1669
Strontium isotopes Sr^{87}
internal conversion coefficients for isomeric transitions of, measurement of, 9: 6529(J)
isomeric transition, 9: 2953(J)
Strontium isotopes Sr^{88}
spins and parities of excited states, 9: 4282(J)
Strontium isotopes Sr^{89}
half life and decay properties, 9: 4559(J)
formation of bone tumors following administration of, in mice, 9: 2547(R)
toxicity of, in dogs, 9: 4911(R)
yield from natural U fission, 9: 1148(J)
Strontium isotopes Sr^{90}
application of, in β sources, 9: 836(J)
bone deposition of, following dietary administration, effects of Ca and PO_4, 9: 848
distributed in rubber beads, β radiation dosage determinations, 9: 6587(J)
half life, 9: 3691(J)
hematological effects and survival time following injections of, in monkeys, 9: 2114(J)
K and L x rays following autoionization, measurement of, 9: 6534(J)
purification, 9: 2399
in radioapplicators for medical use, 9: 6590(J)
radiography using x radiation produced by, 9: 4670
radiotherapy uses for malignant epibulbar melanoma, 9: 5244(J)
separation of Y^{90} from, 9: 7115(J)
thermal neutron fission yields from U^{235}, 9: 817
toxicity of, in mice, 9: 6820(R)
toxicology of, for lambs, 9: 1156(R)
toxicology of body-burden-from-birth of, on development of an infant monkey, 9: 5571
yield from natural U fission, 9: 1148(J)
Strontium isotopes Sr^{91}
half life and decay properties, 9: 4559(J)
Strontium–magnesium alloys
crystal structure, 9: 683(J)
Strontium oxides
partial pressures of gaseous, and heats of sublimation and dissociation, 9: 5885(J)
phosphors, bismuth activated, absorption and emission spectra of, 9: 6545(J)
Strontium sulfates
surface area determination of, by ion exchange, 9: 4370(J)
Strontium sulfides
activated, paramagnetic resonance spectrum and quantum efficiency, 9: 4487(J)
Strontium titanates
compacted with Pb titanates, dielectric and thermal properties and lattice dimensions of, 9: 2704(J)
Structural columns
creep tests and thermal properties, equipment and techniques for, 9: 6996
Structural materials
(See Building materials.)
Structures
bending and buckling of spherical shells, nonlinear theory, 9: 7739
containing commercial windows, effects of blast on, 9: 6817
response to dynamic loading and shock motion, 9: 3894
shell-like, bibliography of articles and books, 9: 3439
Styrene polymers
effects of β particles on, 9: 2664(J)
effects of radiation on, 9: 3888(R), 5617(J)
electric conductivity and effects of radiation on, 9: 3889(R)
sulfonates of, hydration of cations in, 9: 3392(J)
three-quantum annihilation of positrons in, 9: 249(J)
Styrenes
preparation and physical properties of D-labeled, 9: 4413
Sublimation
(See also Heat of sublimation.)
of carbon dioxide, in pressure-altitude measurements in the upper air, 9: 6707
Submarine Advanced Reactor
gas turbine power plant for, cycle study, 9: 3288
Submarine Intermediate Reactor
heat transfer systems, 9: 6999(R)
heat transfer systems, design and testing, 9: 5657(R)
heat transfer systems, testing, 9: 4175(R)
pressure transmitter design for primary coolant system, 9: 272
Submarine power plants
gas turbine cycle study for, with Submarine Advanced Reactor, 9: 3288
Submarine Thermal Reactor
shield testing program in ship, 9: 7957
Subsonic flow
(See also Supersonic flow; Transonic flow.)
local heat emission by plates in, 9: 1493(J)
Sugar phosphates
isolation of tetrose phosphate from Scenedesmus extracts, 9: 7272(R)
separation and identification of, by paper chromatography and ion exchange, 9: 117
Sugars
(See also specific sugars; see also Carbohydrates.)
chromatographic separation of fructose, glucose, and sucrose, 9: 4911(R)
synthesis of, by reduction of aldonic lactones, 9: 3117
Sulfanilamide
acetylation and tissue distribution of, effects of total-body x irradiation on, in rats and guinea pigs, 9: 3729
Sulfate complexes
with U^{4+}, stability at various temperatures, 9: 5629(J)
Sulfate ions
activity measurements in Na_2SO_4 solutions with resin membrane electrodes, 9: 2150(J)
adsorption on charcoal, tracer study, 9: 6889(J)
Sulfates
spectrophotometric analysis for U, 9: 5263(J)
Sulfhydryl group
(See Mercapto group.)

Sulfide crucibles

preparation and properties of Ce, for molten Ti, 9: 2248

Sulfides

(See also specific sulfides.)

electric conductivity of, under controlled H_2S-H_2 atmosphere, 9: 2135(R)

isotopic exchange and mobility of S atoms in, 9: 7682(J)

synthesis and properties, 9: 5926(R)

Sulfonates

of styrene polymers, hydration of cations in, 9: 3392(J)

synthesis of S^{35}-labeled, 9: 519

Sulfonium compounds

hydrolysis of t-butyldimethylsulfonium chloride, 9: 2646(J)

Sulfur

angular neutron elastic scattering cross sections at 2.7 Mev, 9: 4595(J)

deposition in bone, effects of fluorine on, in swine, tracer study, 9: 1156(R)

effect of, on viscosity of alginates, 9: 2658(J)

gamma reactions (γ,d), 9: 1994(R)

gamma reactions (γ,n) and (γ,p), cross sections, 9: 3301(J)

gamma reactions (γ,p), 9: 1994(R)

isotopic exchange and mobility of, in polysulfides, 9: 7682(J)

μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)

microdetermination of, for estimation of sulfite or sulfate, 9: 4383

nucleon total scattering cross sections, 9: 3673(J)

photodeuteron/photoproton yield from, 9: 6054(J)

photonuclear reactions, 9: 2449(J)

proton total cross sections at 208 and 315 Mev, 9: 358(J)

removal from pig iron into the slag of system $CaO-Al_2O_3$, 9: 7683(J)

volumetric microdetermination of, in organic compounds, 9: 80(J)

Sulfur compounds

(See also Chemical warfare agents.)

organic, mobility and isotopic exchange of S atoms in, 9: 7681(J)

organic, volumetric microdetermination of S in, 9: 80(J)

synthesis and properties, 9: 6188(R)

Sulfur dioxide–hydrofluoric acid systems

infrared spectra of anhydrous liquid mixtures, 9: 5925(J)

Sulfur dioxides

catalyzed S^{35} exchange between thionyl chloride and, kinetics, 9: 3058(J)

infrared spectra of anhydrous liquid, 9: 5925(J)

recovery of, from thermal decomposition of $(NH_4)_2SO_4$, 9: 5879

Sulfur fluorides

infrared spectrum, 9: 4092(J)

Sulfur isotopes S^{30}

gamma reactions (γ,p) and (γ,n), yield ratios, 9: 3300(J)

Sulfur isotopes S^{31}

beta emission, 9: 1121, 5755(R)

beta spectrum, measurement, 9: 4266(R)

Sulfur isotopes S^{32}

excited states from P (d,n) reactions, 9: 6776(J)

fast neutron detection using S^{32} (n,p) P^{32} reaction, 9: 3927

neutron reactions (n,p) and (n,α), cross sections of, for neutron energies of 2.2 to 4.0 Mev, 9: 3986(J)

Sulfur isotopes S^{33}

nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)

Sulfur isotopes S^{35}

beta decay, internal and external bremsstrahlung associated with, 9: 2969(J)

beta decay of, K-electron ejection in, 9: 1079(J)

beta spectra, measurement, 9: 437(J)

carotenoid mechanisms studied by, 9: 7665(J)

decay, 9: 6530(J)

exchange between SO_2 and thionyl chloride, kinetics, 9: 3058(J)

oxidation states of, effect of irradiation conditions on, 9: 7724(J)

plant fertilization studied by, 9: 7659(J)

quantitative radiographic determination of β particles from, in single cells, 9: 1734(J)

range in NaCl of, produced by $Cl^{35}(n,p)S^{35}$ reaction, 9: 7943(J)

range of, from reaction S^{34} $(n,\gamma)S^{35}$, 9: 6083(J)

trace amounts of, radiometric determination, 9: 6008(J)

Sulfur oxides

(See also Sulfur dioxides.)

heat and free energy of formation, 9: 529(J)

Sulfuric acid

adsorption of, by polyvalent forms of anion-exchange resins, 9: 2211(J)

atomic hydrogen hyperfine structure in, 9: 1687(J)

corrosive effects on Ti, electron diffraction analysis of, 9: 5970(J)

corrosive effects on Ti and Zr couples, 9: 3151(J)

effects of γ radiation on, 9: 5614(J)

production, cost factors, 9: 6878

solution of Cu_2O by, mechanism of, 9: 849

vapor pressures of water above aqueous, at 25°C, 9: 4935(J)

Sulphide Queen Area (Calif.)

geology, 9: 3837(J)

Sulphide Queen Gold Mine (Calif.)

exploration, 9: 3837(J)

Summerville Formation (Colo.)

geology of, in Horse Range Mesa Quadrangle, 9: 7775(J)

Summerville Formation (Utah)

geology of, 9: 160

Sun

(See also Stars.)

magneto-hydrodynamic whirl ring generation in interior, 9: 5391

"unipolar" magnetic region, association with changes of primary cosmic-ray intensity, 9: 5392(J)

Sundance Formation (Wyo.)

geology and U distribution, 9: 956(J)

Superconductivity

quantum theory of, 9: 6553(J)

Supercritical water

(See Water.)

Supersonic flow

(See also Subsonic flow; Transonic flow.)

around thin wedge, theory, 9: 1244(J)

axisymmetric, high-speed computing machine calculation, 9: 4765

integration of equations of plane turbulent, 9: 1239

plane steady, integratron of equation of motion, 9: 2698(J)

recovery factor for, mathematical analysis, 9: 3809

Supersonic inspection

(See Sonic inspection.)

Supo

(See Los Alamos water boiler.)

Surface-active agents
(See also Flotation reagents.)
influence of, on the overvoltage of H liberation on Pt, 9: 5386(J)
Surface friction
methods of measurement, 9: 5636
Surface properties
effects of α particles on, 9: 2052(J)
Surface tension
estimation of, for 27 metals, 9: 207(J)
method of measuring interphase tension at high temperatures, 9: 1556
methods of measurement, 9: 2340(J)
methods of measurement of, of liquid metals and alloys, 9: 170
Surface waters
analysis for small amounts of radioactive Ba and Sr in, 9: 5604(J)
uranium contents of Wisconsin rivers, 9: 4995
Surfaces
area measurements, 9: 3143
area measurements in powders by gas adsorption, 9: 6955
concrete, treating with paraffin for easy decontamination, 9: 6334
freshly formed metallic, reactivity, 9: 3542(J)
hardening with metalloid elements, 9: 7787(R)
inspection of selected areas of, using replicas and the electron microscope, 9: 247(J)
interference microscope for study of, 9: 689(J)
measurement of finish quality by electric contact resistance, 9: 1948(J)
metal, electron emission and activation of, 9: 7791(J)
metal, friction and wear testing, 9: 4794
monodisperse, of spherical particles, determination of particle size and refractive index near the turbidity maximum, 9: 2798(J)
radioactive contamination and maximum permissible levels, 9: 6804(J)
small angle scattering of x rays and neutrons by irregularities, 9: 3675(J)
wettability of high-energy, 9: 6596
Sweden
gadolinium minerals distribution in, 9: 7335
Swedish reactor
(See SLEEP reactor.)
Swimming pool reactors
(See Bulk Shielding Facility; Michigan Research Reactor.)
beam hole and partial reflector reactivity effects, 9: 7150
fuel element loading equipment, 9: 5497(J)
operating characteristics and research uses, 9: 4869
Swine
lethal dosage determination of radiation for, 9: 1720
Sylvania Electric Products, Inc. Metallurgical Lab., Bayside, N. Y.
progress reports on plastic flow and recrystallization on Ti, 9: 3872(R), 3873(R)
Synchrocyclotrons
design of, for European Organization for Nuclear Research, 9: 4910
design of CERN 600-Mev magnet, 9: 3306
development and design, 9: 6781(J)
short-lived radionuclides produced in, 9: 768(J)
Synchrotrons
(See also Bevatron; Brookhaven Synchrotron.)
acceleration frequency, experimental methods for determining, 9: 4298
Synchrotrons (cont'd)
alternating gradient, magnet configuration and stability of particle orbits in, 9: 2461
alternating gradient 25-bev proton, development of, and construction of electron analog, 9: 2099(R)
beam detection by induction electrode, 9: 5785(J)
beam focusing, 9: 2456
beam inflection and magnet design for CERN machine, 9: 393
beam injection for CERN machine, 9: 771
beam intensity, energy spectrum, and deflection of protons, 9: 2460
beam perturbation, effect of magnet misalignment on, 9: 7165
beams, 9: 2458, 2459
betatron oscillations in, analysis of, 9: 2023
betatron oscillations in Univ. of Michigan, 9: 5787(J)
Brookhaven alternating gradient, development, 9: 5206(R)
compensation windings in electromagnetic fields of proton, 9: 7557
correlation of alignment errors and effect on orbit stability, 9: 399(J)
debuncher to reduce energy spread of protons entering, analysis, 9: 7164
design and construction of BNL alternating-gradient, 9: 4039(R)
design and experimental facilities for CERN, 9: 390
design modifications, 9: 1723(R), 6155(R)
design of proton, developments in 1952 to 1954, 9: 3991(J)
design of strong-focusing, for European Organization for Nuclear Research 9: 4910
design of 300-Mev nonferromagnetic electron, 9: 7558
dynamic measurements of CERN model AC V, 9: 5163
equations of motion and particle orbits in, 9: 7161
focusing in, with periodic field pertubation treatment, 9: 2464
focusing theory, 9: 988(R)
inelastic scattering of accelerated particles in, 9: 6091(J)
injection and beam acceptance of CERN, 9: 4582
injection in the CERN, beam aberrations before, 9: 5164
instrumentation, 9: 2457
magnet coils, power supply for, 9: 1098
magnet design and analysis for CERN, 9: 388
magnet design from measurements with $\frac{1}{3}$-scale model, 9: 2923
magnet design of CERN, 9: 1367, 1652, 4297
magnet design of CERN, and dynamic measurements, 9: 6084
magnet design of CERN, and static measurements, 9: 6085
magnet inhomogeneities in, compensation for, 9: 1100
magnet measurements for CERN model AC V, 9: 4581
magnet measurements for CERN model DC IV, 9: 4580
magnetic field measurements, 9: 391
magnetic field measurements for CERN, 9: 770, 4296
magnetic properties of iron for magnets, 9: 6494
magnets, design of pole face windings for, 9: 4295
nuclear resonance controlled RF generator for, 9: 7162
operation and research program of Purdue 300-Mev, 9: 7944(R)
orbit stability in strong-focusing, 9: 4584(J)
oscillations in particle orbits of strong-focusing, theory, 9: 398(J)
oscillations induced in, by radiation fluctuations, 9: 2466(J)
oscillator frequency and circuits, 9: 392
performance and research program, 9: 2890(R)

Synchrotrons (cont'd)
prompt destruction of electron beam in, method for and analysis of, 9: 2022
proton, beam size determination with potassium iodide probe, 9: 7871(J)
proton, development and design, 9: 6781(J)
proton, mathematical determination of the pole profile, 9: 3661
proton loss in, through large angle scattering, 9: 6505(J)
pulsed magnet power supply for CERN, 9: 5162
radiation hazards from protection against, handbook, 9: 4924(J)
review and principles of and intense focusing principle, 9: 6089(J)
solution of strong-focusing equations, 9: 1371(J)
strong-focusing, betatron oscillations, 9: 2463
strong-focusing, magnet inhomogeneities in, effects, 9: 2462
strong-focusing, numerical data for 30 bev, 9: 1101
strong-focusing, stability of, effect of section lengths on, 9: 1099
vacuum system for 300-Mev nonferromagnetic, 9: 6086
x-ray spectrum of 70-Mev, 9: 2468(J)

Synthetic rubber
(See Elastomers.)

Szilard-Chalmers reactions
in phthalocyanine metal complexes, 9: 1959(J)

T

T particles
decay energy and mass, 9: 2365(J)

Table Mountain Area (S. Dak.)
geologic map of, 9: 5333(J)

Tanks
(See also Pressure vessels; Waste disposal.)
design of elevated, to withstand atomic blast, 9: 2101(J)
elevated, effects of blast from atomic explosion on, 9: 659
welding of 30-ft-diam. steel test, 9: 228(J)

Tantalum
adsorption of O_2 and CO on evaporated films of, 9: 2159(J)
alpha cross sections, 9: 4705(R)
anhydrous separation of, by selective chlorination of partially hydrolyzed chlorides, 9: 908(J)
anodic oxidation of, in ethylene glycol electrolytes, 9: 230
asymmetries in p-n-p double charge-exchange scattering on, 9: 7173(J)
bremsstrahlung in, electron cross sections for, 9: 6046(J)
bremsstrahlung reactions (γ,p) at 23 Mev, yield and angular distribution, 9: 4572(J)
chromatographic determination of, in soil samples, 9: 3404(J)
colorimetric determination of Nb in presence of, 9: 2176(J)
compressibility parameters and Grüneisen's constants, 9: 1863
corrosion by nitric oxide at high temperature, 9: 6308(J)
determination of microgram amounts of, in iron by x-ray fluorescence analysis, 9: 4382
deuteron reactions (d,p) at 15 Mev, proton energy spectra from, 9: 4574(J)
differential neutron elastic scattering cross sections at 4.1 Mev, 9: 4597(J)
elastic scattering of 40-Mev α particles from, 9: 7132(J)
elastic scattering of high-energy polarized protons by, 9: 4885
filament activation by Gd, 9: 2794
film-surface area of evaporated, measurement, 9: 3887(J)
gamma ray yields from Coulomb excitation, 9: 6052(J)
gravimetric determination of, in U- or Zr-base alloys, 9: 5274(J)
intermetallic compound with Sn, preparation and structure, 9: 3870(J)
liquid-liquid extraction of, with hydrochloric acid from an aliphatic ketone solution, 9: 907(J)
neutron total cross sections, 9: 5423
oxidation of, under conditions of linear temperature increase, 9: 181
photonuclear reactions, 9: 2449(J)
physical properties for furnace design, review, 9: 1213
preparation, properties, and industrial uses, review, 9: 7371(J)
production of ductile, by Kroll process, 9: 985(J)
proton fission cross section at 450 Mev, 9: 7552(J)
proton range in, 1- to 7-Mev, 9: 6788(J)
proton reactions of, at 32 Mev, 9: 736
proton reactions (p,n), angular distributions and yields at 23 Mev, 9: 4290(J)
quantitative separation and determination in mixtures of Nb and, 9: 7703(J)
radiometric determination, 9: 2634
reaction with fused NaOH, 9: 1466
spectrographic determination of, in ores and rocks, 9: 162
spectrophotometric determination of, in ores, 9: 3405(J)
thermal expansion, 9: 1266
volumetric determination of Zr in the presence of, 9: 7702(J)
wetting with sodium silicate glass and formation of $Na_2Ta_2O_6$, 9: 6449(J)

Tantalum–aluminum–titanium alloys
hardness, crystal structure, and phase studies, 9: 3520
oxidation, 9: 3849(R)

Tantalum borides
preparation by vacuum technique, 9: 1821(J)
reactions with C and N_2, equilibria studies, 9: 5677(J)

Tantalum carbides
properties of, effect of molten Ti on, 9: 2247
reaction of Th with, at high temperatures, 9: 1247

Tantalum–carbon–silicon systems
phase diagrams, 9: 4704

Tantalum compounds
toxicity, 9: 845(J)

Tantalum isotopes
electromagnetic separation, chemistry, 9: 6390
second naturally occurring, of mass 181 ± 2, evidence for, 9: 2400(J)

Tantalum isotopes Ta^{180}
electromagnetic separation and purification, chemistry, 9: 6390
existence in naturally occurring state, evidence for, 9: 2401(J)

Tantalum isotopes Ta^{181}
energy levels, spacings and neutron widths of, 9: 6045(J)
gamma emission, directional correlation, 9: 7893(R)
gamma rays from Coulomb excitation, angular distribution of, spin sequence from, 9: 6053(J)
quadrupole moments, 9: 7130(J)

Tantalum isotopes Ta^{182}
disintegration, 9: 3338(J)

Tantalum isotopes Ta^{182} (cont'd)
gamma emission, 9: 1133, 4333
implants of, in irradiation of tumors, 9: 5242(J)
neutron capture cross sections, 9: 3279(J)
Tantalum isotopes Ta^{183}
disintegration, 9: 3336(J)
gamma spectra, 9: 4333
radiation characteristics of, 9: 5816(J)
Tantalum isotopes Ta^{184}
formation and decay characteristics, 9: 6114(J)
Tantalum isotopes Ta^{186}
radiation characteristics of, 9: 5816(J)
Tantalum–manganese–oxygen systems
metallic ternary phases in, 9: 3185(J)
Tantalum–niobium–oxygen systems
phase studies, 9: 6260
Tantalum nitrides
crystal structure and phase studies, 9: 1273(J)
Tantalum oxide films
optical properties of thin, 9: 2805(J)
Tantalum oxides
heat and free energy of formation, 9: 529(J)
powder diffraction analysis of Ta_2O_5, 9: 5912(J)
toxicity of, in lungs of guinea pigs, 9: 6854(J), 6855(J)
Tantalum–oxygen systems
chemical properties, hardness, phase studies, and preparation, 9: 6260
Tantalum silicides
reactions with C and N_2 at 2000°K, 9: 4704
Tantalum sulfides
x-ray studies of, 9: 887(J)
Tantalum–titanium alloys
hot-rolled textures of, 9: 1636(R)
phase studies and physical properties, 9: 1528
quench transformation in, 9: 1844(R)
Tantalum–zirconium alloys
fabrication and phase studies, 9: 1530(R)
preferred orientation, 9: 190(R)
tensile properties, 9: 5058(R)
Targets
(See Radiation targets.)
Teapot Operation
fall-out in Kingston, Ontario from, 9: 7093(J)
fall-out monitoring following, 9: 7636
Technetium
detection, radioactivity, and separation, 9: 1590
Technetium isotopes
production and identification, 9: 7133(J)
relative abundance, 9: 1590
Technetium isotopes Tc^{95}
electromagnetic separation and energy level assignment, 9: 7442
Technetium isotopes Tc^{96}
gamma emission, 9: 743(J)
Technetium isotopes Tc^{98}
natural occurrence of, in Mo minerals, 9: 664(J)
occurrence in nature, 9: 2787
Technetium isotopes Tc^{99} (cont'd)
production identification, and half life, 9: 7133(J)
radiations from, 9: 7575(J)
Technetium isotopes Tc^{99}
analysis of β-decay, 9: 7579(J)
formation in stars by neutrinos, 9: 1914(J)
metastable state of short half life, 9: 4624(J)
Technetium isotopes Tc^{102}
half lives of, 9: 448(J)
Technetium isotopes Tc^{104}
half lives of, 9: 448(J)
Technetium oxides
heat and free energy of formation, 9: 529(J)
Technical Information Service, AEC
corporate author entries used in cataloging reports, 9: 4658
cumulated numberical list of reports available, 9: 6146
non-published reports on nuclear science, bibliographies, 9: 6185
reports on nuclear technology, 9: 6186
Tecolote District (N. Mex.)
exploration of, 9: 955(J)
Teeth
developing, pathological effects of radiation on, in rats, 9: 464(J)
Teflon
(See Ethylene, tetrafluoro- polymers.)
Tellurium
anion exchange separation, 9: 3109(J)
reaction with dichlorodifluoromethane, 9: 3419(J)
Tellurium fluorides
infrared spectra and molecular structure of TeF_6, 9: 3410
Tellurium ions
energy thresholds for decomposition of, in collision with He, 9: 6785(J)
Tellurium–iron systems
surface tension, 9: 2702(R)
Tellurium isotopes
yield from 14-Mev neutron fission of U^{235}, 9: 7222(J)
Tellurium isotopes Te^{122}
energy levels from Sb^{122} decay, 9: 4631(J)
K-shell internal conversion coefficients and multipolarity assignments, 9: 5535(J)
Tellurium isotopes Te^{123}
Coulomb excitation spectra of, 9: 6444(R)
Tellurium isotopes Te^{124}
angular correlations, 9: 1067(R)
Tellurium isotopes Te^{125}
Coulomb excitation spectra of, 9: 6444(R)
Tellurium isotopes Te^{129}
decay scheme, 9: 1994(R)
gamma spectra, 9: 6119(J)
Tellurium isotopes Te^{131}
disintegration, 9: 3336(J)
gamma spectra, 9: 6119(J)
Tellurium isotopes Te^{132}
metabolism of mixtures of I^{132} and, in rats and guinea pigs, 9: 3754(J)
Tellurium oxides
heat and free energy of formation, 9: 529(J)

Tellurium oxides (cont'd)
vaporization, 9: 2627(J)
Tellurium–thorium systems
phase studies, 9: 1192(J)
Temperature
effects of high, on survival and cleavage of irradiated Ascaris eggs, 9: 2571(J)
effects of, on radiation injuries in seed of barley, 9: 2593(J)
of gases, probes for measurement, design, 9: 3578
liquid helium vapor pressure–temperature scale, revised, 9: 4481
measurement of, performance of Temp-Tape containing alloys, 9: 2335
miniature recorders for flight use, design, 9: 3915
Temperature control
system for isotope separation device sources, 9: 7994(P)
Temple Mountain District (Utah)
mineralogy, 9: 1829
occurrence of unoxidized U deposits in, mineralogy of, 9: 5948(R)
Temple Univ., Philadelphia. Research Inst.
progress reports on high-temperature research on metals, 9: 57(R) 3498(R)
Tennessee
exploration of Chattanooga shale for U in Bedford, Coffee, Moore, and Summer Counties, 9: 4997(R)
Tennessee (Davidson Co.)
occurrence of Ge and U in coalified wood from upper Devonian blackshale in, 9: 6277(J)
Tennessee Univ., Knoxville
progress reports on decomposition of eutectoids in alloy systems, 9: 1265(R)
progress reports on effect of wetting on heat transfer characteristics of liquid metals, 9: 1807(R)
progress reports on investigation of Chattanooga black shale, 9: 4997(R)
progress reports on radiobiological research, 9: 1156(R)
Tennessee Valley Authority
report lists, 9: 468(J)
Tennessee Valley Authority, Wilson Dam, Ala.
progress reports on utilization of Florida leached zone material, 9: 1183(R), 1746(R), 5640(R)
Terbium
determination in Zr, 9: 5890(J)
separation from rare earths by ion exchange, 9: 5889(J)
spectrographic determination of, in Dy, 9: 5272(J)
tissue distribution of, in rats, tracer study, 9: 3730(R)
x-ray absorption spectra (L_3), 9: 4904(J)
x ray emission spectrum, 9: 6129(J)
Terbium fluorides
equilibrium pressures, measurements, 9: 4705(R)
Terbium isotopes
neutron deficient activities of, produced by p bombardment of Gd, 9: 7514(J)
Terbium isotopes Tb^{154}
half life and mass, 9: 7514(J)
Terbium isotopes Tb^{155}
half life, 9: 7514(J)
Terbium isotopes Tb^{156}
half life, mass, and γ spectrum of, 9: 7514(J)
Terbium isotopes Tb^{157}
half life, 9: 7514(J)
Terbium isotopes Tb^{158}
half life, 9: 7514(J)
Terbium isotopes Tb^{159}
energy levels, spacings and neutron widths of, 9: 6045(J)
nuclear magnetic moment and spin, 9: 3627(J)
Terbium isotopes Tb^{160}
bone deposition of, in rats, 9: 7232(R)
internal conversion, 9: 1994(R)
Terbium isotopes Tb^{161}
decay, 9: 7189(J)
fission yield of, from natural U, 9: 1700(J)
Terbium oxides
dissociation pressures of, by x-ray and differential thermal analysis, 9: 111(J)
preparation of, by high-pressure molecular O treatment, 9: 903(J)
Terephthalic acid, ethylene polymer esters
electric conductivity of, induced by x radiation, 9: 4013(J)
Terphenyl
alpha-induced scintillation in xylene solution, mechanism, 9: 4519(J)
pyrolysis, 9: 4701
Terphenyl–biphenyl systems
chemical interactions, 9: 4701
Testes
(See Gonads.)
Tetraethylene glycol, dibutoxy-
solvent extraction of U with, 9: 7310
Tetrathionates
spectrophotometric determination, 9: 3779
Tetryl
detonation velocities of, 9: 3214
Texas
gadolinium minerals distribution in, 9: 7335
Textiles
(See also Clothing.)
bonding to textiles and to class Al and alloys, 9: 651
cotton, thermal shielding properties, 9: 5572
cotton oxford fabrics, use in thermal radiation protection, 9: 5840
diffuse reflectance, 9: 2521(J)
a light poncho material, thermal shielding properties, 9: 4050
protective effects of assemblies of, against radiant energy burns in pigs, 9: 1157
testing, for ion exchangers, 9: 6228(R)
thermal shielding properties, 9: 481
thermal shielding properties of, following various treatments, 9: 5111
Thallium
effect of CN^- on the exchange rate of Tl^+–Tl^{3+}, 9: 5594(J)
excitation functions, 9: 7128(J)
gamma ray yields from Coulomb excitation, 9: 6052(J)
nuclear magnetic moments, 9: 2895
photochemical effects of, 9: 1784
radiochemical determination, 9: 876
self-diffusion of, in Ag–Tl alloys, 9: 7352(R)
spectrographic determination of, in ores and rocks, 9: 163
Thallium alloys
nuclear magnetic moments, 9: 2895
Thallium bromides
lattice constants, 9: 3408

Thallium chlorides
crystal structure, 9: 544(J)
lattice constants, 9: 3408
solubility, 9: 1784

Thallium fluorides
preparation and heat of formation, 9: 2158(J)

Thallium halides
microwave spectra, 9: 731(R)

Thallium–indium alloys
diffusionless phase transformation, crystal structure, heat treatment, and effects of tensile and compressive stresses, 9: 1861(R)
thermal conductivity of, at low temperature, 9: 3202(J)

Thallium ions
inclusion in NaCl and KCl, calculations, 9: 7419(J)
ion-exchange equilibria on Dowex 50 resins, 9: 6623(J)

Thallium isotopes
decay schemes of neutron-deficient, 9: 3689(J), 3690(J)
isomeric levels and transitions of neutron-deficient, 9: 3688(J)

Thallium isotopes Tl^{203}
Coulomb excitation and γ spectra, 9: 4275(J)
half life of 279-kev level, 9: 7141(J)
lifetime of first excited state, 9: 7916(J)

Thallium isotopes Tl^{204}
beta spectra, 9: 2959(J), 5117
decay scheme, 9: 2963(J)
electrodepositing technique for, on Cu preparation of high-energy β source by, 9: 1289(J)
fission cross sections for 380-Mev neutrons, 9: 5156(J), 5778(J)
half life, 9: 4898(J)

Thallium isotopes Tl^{205}
Coulomb excitation and γ spectra, 9: 4275(J)
nuclear magnetic resonance in metallic thallium and thallium oxide, measurements and theory, 9: 3972(J)

Thallium isotopes Tl^{206}
energy levels, 9: 7576(J)
milligram radium equivalent of, 9: 1342(J)
spin assignments, 9: 2974(J)

Thallium isotopes Tl^{209}
decay schemes and nuclear spectra, 9: 4863

Thallium oxides
heat and free energy of formation, 9: 529(J)

Thallium–silver alloys
diffusion of Ag and Tl in, 9: 188(R)
self-diffusion of Tl in, 9: 7352(R)

Thermal capacity
in solids, effect of particle size on, 9: 5277(J)

Thermal conductivity
(See also appropriate subheadings under specific materials; see also Heat transfer.)
apparatus for measuring, of metals in vacuum at high temperatures, 9: 3554(J)
bibliography on determination of, of metals at elevated temperatures, 9: 1535
temperature dependence of, effect on computational method of balances, 9: 4985
equipment, 9: 6875(R)
equipment for measurement, 9: 99
equipment for measurement of, in refractory materials, 9: 7327(R)

Thermal conductivity (cont'd)
equipment for measurement of, of metals and alloys, 9: 989
measurement, 9: 5634
measurement of, at high temperatures, 9: 1564(J), 3822(J)
of metals at high temperatures, theory and design and performance of equipment for measurement, 9: 1502
methods of measurement, 9: 1252

Thermal conductivity cells
design of, for measuring temperature distribution in steel–Hg–steel systems, 9: 1807(R)

Thermal conductometric analysis
of ortho-para hydrogen mixtures, equipment for, 9: 3399(J)

Thermal diffusion
columns, performance of hot-wire, 9: 4095(J)
enrichment of radioisotopes by, 9: 4505(J)
in liquids, 9: 4717(J)
in liquids, theory, 9: 2797(J)
tritium concentration, column for, 9: 6393(J)

Thermal injuries
(See Burns.)

Thermal insulation
(See also Ceramic materials; Thermal radiation shielding.)
metallic and mineral wool, comparison of thermal conductivity, 9: 4986
properties of, for use in electromagnetic pumps, 9: 7748
properties of castable, for use in fabricating adhesive bonding presses, 9: 4114(R)
sodium reactivity and performance tests, 9: 4122
testing of, in liquid Na, 9: 4175(R)

Thermal neutrons
activities produced by, tables for simplifying calculations of, 9: 2514(J)
bacteremia in mice following exposure to, 9: 5836
chromosome breakage and rejoining capacity following exposure to, in Trillium, 9: 1154
detection and measurement, uranium glass for, 9: 5126(J)
detection and measurement of, by borazole filled proportional counters, 9: 2417
detection and measurement of, design and performance of a stacked-disk neutron thermopile for, 9: 4515
detection and measurement of, with scintillation counters, 9: 1036
diffusion parameters in H_2O, 9: 1387(J)
dosage determination of, film-badge dosimeter for, 9: 6724
effective lifetime in SLEEP reactor multiplying medium, 9: 6068(J)
effects on barley seed, 9: 3369(J)
effects on chromosomal aberrations and rejoining, in Trillium, 9: 476
effects on chromosome aberrations in Datura, compared with effects of fast neutrons on x radiation, 9: 5233(J)
effects on lethality, atrophy of small intestine and Fe^{59} uptake and red blood cells in rats, 9: 1711
effects on survival of E. coli, 9: 2099(R)
energy spectra and inelastic scattering by Cu, Be, Al, and Pb, 9: 3326(J)
induction of sex-linked lethal mutation rates in Drosophila melanogaster by, 9: 7631(J)
inelastic scattering in polycrystalline solids, influence of thermal motion on, 9: 7499(J)
late biological effects of, in mice, 9: 20(J)
magnetic scattering of, from O_2 gas, 9: 2487(J)
measurement of, from Pu^{241} fission, 9: 7095
polarization of, by noncrystalline ferromagnets, 9: 1627(J)

Thermal neutrons (cont'd)
reflection of, by calcite, 9: 7833
relative biological effectiveness of, in mammalian systems, compared with effects of other radiations, 9: 3007
sensitivity of dormant and germinating barley seed to, 9: 5853(J)
small angle scattering by surface irregularities, 9: 3675(J)
transport mean free path in D_2O at 13°C, 9: 2476(J)
Thermal radiation
(See also appropriate subheadings for effects on specific devices, materials, and organisms; see also Heat transfer; Infrared radiation.)
absorption at high temperatures and transmission through porous materials, 9: 4779(R)
circulatory disturbances following trauma induced by, in dogs, 9: 5210
cutaneous response to, time-energy relationship in swine, 9: 5212
detection and measurement, design of a spectrometer for, 9: 916
erythrocyte deficiency following exposure to, 9: 4913
measurement, design of calorimeters for, 9: 6406
on pigs, hemoglobinemia induced by, 9: 5841
production of burns in rabbit ears following exposure to, determinations of severity by uptake of injected P^{32}, 9: 6566
response of skin to, effect of color on, in swine, 9: 4045
Thermal radiation shielding
effectiveness of a light poncho material for, 9: 4050
effectiveness of cotton fabric, 9: 5572
effectiveness of cotton oxford fabrics for, 9: 5840
effectiveness of fabrics as, against flash burns of skin, 9: 481
effectiveness of textile assemblies for, in pigs, 9: 1157
effectiveness of treated fabrics for, of skin of swine, 9: 5211
Thermal radiation sources
calibration of, performance of spectrometer, 9: 916
design, 9: 234
effectiveness of, in production of cutaneous burns, 9: 6156
energy pulses from, method for shaping, 9: 5383
tungsten lamp suitable for production of flash burns, design, 9: 4503(J)
Thermal reactors
(See also specific thermal reactors.)
dynamics and control, 9: 7919
generation time and effective multiplication factor, calculations of, 9: 6482(J)
multiplication factors in, calculations, 9: 7157(J)
temperature rise in, as result of cooling, 9: 2015(J)
thermal utilization in large heterogeneous, 9: 3981(J)
Thermal rupture
(See also appropriate subheadings under specific materials.)
of ceramic materials under quasi-static thermal stresses, 9: 1506(J)
design and performance of equipment for testing, 9: 5638
effects of porosity on, 9: 1507(J)
effects of shape on, 9: 1503(J)
of spherical shapes, 9: 1497(J)
testing of materials by resistance to, 9: 1496(J)
theory, for brittle materials, 9: 142
Thermal shielding
(See Thermal radiation shielding.)
Thermal stresses
bibliography on, 9: 4211
in plates and shells, mathematical analysis, 9: 7740(J)
in rectangular strips, theory, 9: 5390(J)
resistance of ceramic materials to factors affecting, 9: 1505(J)
Thermochromism
in bianthrone and bixanthylene, LCAO MO study of, 9: 2144(J)
Thermocouples
(See also Pyrometers; Thermopiles.)
calibration and development of, 9: 185
effects of high neutron flux on, 9: 429
measurement of emf, potentiometer for, design and performance, 9: [illegible]
microscope attachment for observing high-temperature phenomena, 9: 1589(J)
potentials recording of, 9: 2386
Thermodynamic properties
bibliography on, of elements, 9: 657
free energy and heats of sublimation of liquid and solid elements, tables, 9: 5079
of solid solutions, determination of, 9: 7394(J)
Thermodynamics
analysis of low-temperature irreversible thermodynamic processes, 9: 238(J)
effect of degree of dispersion of phases on equilibrium, 9: 63
electrochemical techniques in, of metallurgical systems, 9: 7674
of ion exchange systems, 9: 116
of melting in solids, 9: 7387
of melting in the alkali metals, 9: 7388
statistical, of isotope effects, 9: 1418
theory of phase transitions, 9: 7403(J)
Thermonuclear explosions
cumulative effects on surface of earth induced by, 9: 818(J)
effects of, on the weather, 9: 3274(J)
pathological effects of fall-out, 9: 5861(J), 5866(J), 5867(J), 5868(J)
Thermonuclear reactions
electron screening effects on rate of, 9: 733(J)
in stars, involving protons on light nuclei, 9: 3647(J)
Thermopiles
(See also Thermocouples.)
neutron, design and performance of, using U^{235}, 9: 4530(J)
neutron flux measurement in reactors, 9: 7070(R)
stacked-disk neutron, design and performance, 9: 4515
Thickness gages
induction and x-ray types, design for measuring band thickness in rolling, 9: 1947(J)
radioactive, for metals, 9: 7805(J)
radiometric, for thin α-active layers, design, 9: 1236
Tolansky gage for rapid measurement of film thickness, design, 9: 4502(J)
x-ray, design, 9: 1983(J)
6-Thioctic acid
(See Caprylic acids, thio-.)
Thiocyanate complexes
of Fe^{3+}, formation, reaction kinetics, 9: 6880
with U^{4+}, stability at various temperatures, 9: 5629(J)
Thiocyanates
(See also specific thiocyanates.)
potassium, effects on accumulation of At^{211} and I^{131} by thyroid gland, 9: 1709(J)
reaction with Fe^{3+}, kinetics, 9: 4705(R)
Thiodiphenylamine
(See Phenothiazine.)
Thiols
adsorption of, on Zn minerals, 9: 166(J)
Thionyl chloride
catalyzed S^{35} exchange between SO_2 and, kinetics, 9: 3058(J)

Thionyl chloride (cont'd)
spectra and electronic structure, 9: 4957(J)
Thionyl fluoride
infrared spectra, 9: 5902(J)
Thompson's District (Utah)
geology and U distribution, 9: 5049(J)
Thrinaites
occurrence in Ontario and Quebec, composition, lattice constant, and diffraction intensities, 9: 6655(J)
x-ray studies, 9: 1233(J)
Thorium
analysis and determination, procedures, 9: 4943
chemical determination of, in Al–Th alloys, 9: 1759
colorimetric determination of, with nitroso R-salt, 9: 6198(J)
colorimetric determination with alizarin red S, 9: 6902(J)
concentration in stone meteorites by Pb^{207}/Pb^{206} method, 9: 4445(J)
cosmic abundance of, in chondritic meteorites, 9: 3065(J)
deformation and annealing textures in, 9: 5366(J)
determination and separation from U by 2,4-dichlorophenoxyacetic acid, 9: 3782(J)
determination in Mn nodules of ocean sediments, 9: 3819(J)
determination of, in ancient marine sediments, 9: 7764(J)
determination of, in minerals with proportional counters, 9: 957(J)
determination of, in mixtures with Fe, Zr, and Ti, by use of 2,4-dichlorophenoxyacetic acid, 9: 2641(J)
determination of, with organic reagents, 9: 5275(J)
determination of microgram amounts of, in iron by x-ray fluorescence analysis, 9: 4362
determination of trace amounts of, in ores, 9: 81(J)
determination with aryl fatty acids, 9: 2168(J)
determination with organic reagents, 9: 6202(J)
dissolution of, in acids, 9: 2783(J)
distribution in allanites, 9: 6209(J)
elastic scattering of 40-Mev α particles from, 9: 7132(J)
electrolytic separation from monazites, 9: 7986(P)
exploration for, book, 9: 960(J)
extraction by mesityl oxide, 9: 2674(J)
fabrication, properties, and sintering, 9: 5368(J)
gamma ray yields from Coulomb excitation, 9: 6052(J)
gravimetric determination in cerium earth minerals, 9: 5608(J)
gravimetric determination of, in rare earth and U by precipitation with hydroxy toluic acid, 9: 2643(J)
gravimetric determination with 5-iodo-anthranilic acid, 9: 2642(J)
internally deposited, measurement of total-body γ radiation from, in patients, 9: 5726(J)
ion exchange of, from Ac and Ra at high temperatures, 9: 593(J)
lattice defects and electrical resistivity, 9: 2330
multiple scattering of slow neutrons by, 9: 5805(J)
neutron yield from photodisintegration, 9: 7933(J)
powder metallurgy, 9: 5368(J)
properties and reactor applications, 9: 6476
proton fission at 480 Mev, cross sections and distribution curve, 9: 7936(J)
proton fission cross sections at 450 Mev, 9: 7552(J)
proton reactions (p,f), (p,n), and (p,3n), excitation functions and cross sections, 9: 4288(J)
proton reactions (p,n), angular distributions and yields at 23 Mev, 9: 4290(J)
quantitative determination of, in samples of rock, minerals, and ores by fluorescent x-ray analysis, 9: 5603(J)
Thorium (cont'd)
radiation damage and He impregnation of α-irradiated, 9: 7389(R)
radiation damage by deuterons and protons, 9: 5959
radioactivation determination of small quantities, 9: 4389(J)
radiometric determination, 9: 2634
reaction of, at high temperatures with refractory compounds, 9: 1247
recovery and estimation from industrial wastes with organic reagents, 9: 4079(J)
recovery from monazite sands, 9: 592(J)
room- and elevated-temperature mechanical properties and heat treatment, 9: 3840(R)
separation and determination of, in Al–Th mixtures, 9: 5268(J)
separation and estimation from cerite earths, 9: 594(J)
separation by precipitation and polarographic determination of minute quantities of, 9: 883(J)
separation from cerite earths and monazites by p aminosalicylic acid, 9: 5892(J)
separation from coral limestone samples for radiometric determination of Th^{230}, 9: 1762
separation from rare earths and determination of, with organic bases, 9: 7705(J)
separation of rare earths from, by solvent extraction, 9: 6620
spectrophotometric determination in zircon, 9: 4945
spectrophotometric determination of, in presence of Ce and La, 9: 83(J)
spectrophotometric determination of, using naphthazarin, 9: 5607(J)
spontaneous fission, half life, 9: 5187(J)
titrimetric determination, 9: 875
toxicology of, results of an industrial hygiene survey on a thorium refinery, 9: 3375(J)
volumetric determination, 9: 5601(J)
volumetric determination of, by chelation with ethylenediaminetetraacetic acid, 9: 6905(J)
volumetric determination with anthranilic acid, 9: 2642(J)
Thorium alloys
constitution diagrams, compilation of, 9: 5349
history of, in foundries in the U. S., 9: 7372(J)
properties and reactor applications, 9: 6476
Thorium–aluminum alloys
analysis of, for Al and Th, 9: 5268(J)
chemical analysis of, for Th, 9: 1759
crystal structure, 9: 3237(J)
crystal structure of AlTh, $AlTh_2$ and Al_7Th_4, 9: 4473(J)
Thorium borides
reactions with C and N_2, equilibria studies, 9: 5677(J)
Thorium chelates
with 8-quinolinol, precipitation of, and separation from Ce and La, 9: 83(J)
Thorium complexes
with Alizarin Red S, chemical properties, 9: 875
Thorium compounds
organo-, chemistry, review, 9: 6893(J)
polarographic behavior of, in molten ammonium formate, 9: 7292
Thorium deposits
associated with radioactive Fe minerals, 9: 5001(J)
Thorium deposits (Idaho)
occurrence, 9: 1520(J)
Thorium deposits (Mont.)
occurrence, 9: 1520(J)
Thorium–gold alloys
radiation damage by deuterons and protons, 9: 5959
Thorium hydroxides
colloid suspensions, electrolyte effects on surface of, 9: 1193(J)

Thorium ions
hydrolysis of, 9: 1470(J)
Thorium isotopes
ingestion by luminous dial workers, late pathological effects, 9: 40(J)
Thorium isotopes Th^{226}
decay and low-lying states of spin 1– in, 9: 1633(J)
decay schemes and nuclear spectra, 9: 4863
Thorium isotopes Th^{227}
half lives, 9: 2952
radiation emissions from, 9: 6109(J)
Thorium isotopes Th^{228}
decay and low-lying states of spin 1– in, 9: 1633(J)
decay schemes and conversion electrons, 9: 383(J)
decay schemes and nuclear spectra, 9: 4863
first excited state, half life of, 9: 6121(J)
gamma emission, energy measurement by secondary electron absorption, 9: 809(J)
rotational levels, 9: 7525(J)
Thorium isotopes Th^{229}
decay schemes and nuclear spectra, 9: 4863
Thorium isotopes Th^{230}
angular correlations, 9: 2901(J)
decay schemes and conversion electrons, 9: 383(J)
decay schemes and nuclear spectra, 9: 4863
fission fragments from 22-Mev proton bombardment, angular distribution, 9: 4654(J)
internal conversion spectrum, 9: 381(J)
gamma spectra, 9: 4705(R), 7272(R)
radiometric determination of, in coral limestone, 9: 1762
rotational levels, 9: 7525(J)
Thorium isotopes Th^{231}
decay schemes and nuclear spectra, 9: 4863
Thorium isotopes Th^{232}
fission and total cross sections for 22-Mev protons on, 9: 738(J)
fission cross sections for 380-Mev neutrons, 9: 5156(J), 5778(J)
fission fragments from 22-Mev proton bombardment, angular distribution, 9: 4654(J)
thermal neutron absorption cross sections, 9: 6558(J)
thermal neutron activation cross sections, 9: 3970(J)
Thorium isotopes Th^{233}
half life, 9: 4389(J)
Thorium isotopes Th^{234}
preparation of carrier-free, 9: 876
Thorium–magnesium alloys
determination of solubility of Th in Mg at 1050°F, 9: 4161(R)
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)
solid solutions of Th in magnesium, 9: 5050
Thorium–magnesium alloys (liquid)
electromagnetic pump and heating transformer for, design, 9: 931
Thorium–magnesium–zirconium alloys
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)
Thorium minerals
glossary and chemical classification of, 9: 3465(J)
occurrence in Alaska, 9: 1523(J)
Thorium–molybdenum alloys
creep-rupture tests at 1600°, 1800°, and 2000°F, 9: 4799(R)
ductility, effects of various alloying additions on, 9: 5953(R)
Thorium–molybdenum–tungsten alloys
forging in inert gas, 9: 984(J)
Thorium nitrate–water systems
heat of solution, 9: 6868
Thorium nitrates
preparation of anhydrous, by thermal decomposition of $Th(NO_3)_4 \cdot 2H_2O$, 9: 2224(J)
reaction of tetrahydrate of, with nitrogen oxides to form $Th(NO_3)_4 \cdot 2H_2O$, 9: 2224(J)
Thorium ores
(See also Monazites.)
analysis of, by fluorescent x-ray spectrometry, 9: 5271(J)
analysis of, for Th traces, 9: 81(J)
beta ionization intensity from, 9: 5814
Thorium oxide crucibles
preparation and properties of, for molten Tl, 9: 2246
Thorium oxide crystals
polarization, 9: 3553(J)
Thorium oxide–lanthanum oxide systems
lattice disorder and electrical resistance in, 9: 7396(J)
Thorium oxide–rhenium compacts
fabrication, mechanical properties, microstructure, and thermionic emission, 9: 976
Thorium oxide–titanium systems
hardness and microstructure, 9: 2246
Thorium oxide–uranium oxide systems
chemisorption of O_2 on, 9: 603(J)
crystal structure and physical properties, 9: 7319(J)
electric conductivity, 9: 7277(J)
oxidation of, phase diagrams, 9: 1796(J)
oxygen exchange studies, 9: 4705(R)
preparation, crystal structure, phase studies, density, and oxidation, 9: 602(J)
Thorium oxide–yttrium oxide systems
phase studies, fluorite phase in ThO_2–Y_2O_3, 9: 7276(J)
Thorium oxides
clinical uses, late pathological effects, 9: 40(J)
lattice disorder and electrical resistance in, 9: 7396(J)
determination of, in rock samples by fluorescent x-ray spectrometry, 9: 5271(J)
properties of, effect of molten Tl on, 9: 2246
reaction of Th with, at high temperatures, 9: 1247
Thorium(IV) oxides
change of apparent density, rate of solution in HCl, and thermal and x-ray analysis, 9: 1184(J)
effectiveness as internal γ emitter, study after intravenous injection into rabbits, 9: 5865(J)
separation from rare earths with urotropine, 9: 3431(J)
slip casting of, for production of laboratory ware, 9: 5969(J)
Thorium–oxygen systems
chemical properties, hardness, phase studies, and preparation, 9: 6[illegible]
Thorium–rhenium alloys
fabrication and microstructure of arc-melted, 9: 976
Thorium salts
analysis of, procedures, 9: 4943
Thorium–silicon systems
phase studies, physical properties, and x-ray diffraction analysis of $ThSi_2$, 9: 4990
Thorium–tellurium systems
phase studies, 9: 1192(J)
Thorium–titanium alloys
surface hardening by nitridation, 9: 978(R)
Thulium
separation from rare earths by ion exchange, 9: 5889(J)

Thulium (cont'd)
spectra, 9: 4963
spectra, hyperfine structure of, 9: 2204(J)
spectrographic determination of, in Er, 9: 5272(J)
x-ray absorption spectra (L), 9: 4904(J)
x ray emission spectrum, 9: 6129(J)
Thulium chlorides
crystal structure, 9: 544(J)
Thulium isotopes Tm^{169}
energy levels, spacings and neutron widths of, 9: 6045(J)
nuclear magnetic moments, 9: 2204(J)
Thulium isotopes Tm^{170}
beta-γ angular correlations, victor-tenor interactions, 9: 7580(J)
bone deposition of, in rats, 9: 7232(R)
electron spectra, 9: 7185
radiographic applications, 9: 2241(J)
Thulium isotopes Tm^{171}
beta decay, 9: 6522(J)
Thymonucleic acids
(See Nucleic acids.)
Thymus
formation of tetanus antitoxin by, 9: 2099(R)
nucleic acid content of cells of, effects of irradiation on, in mice, 9: 2558(J)
radiosensitivity, 9: 6820(R)
weight, effects of exposure to total-body x irradiation on, in mice, 9: 4877(J)
Thyroid diseases
correlation between renal function and I^{131} clearance in hyperthyroidism, and myxedema, 9: 1180(J)
diagnosis, 9: 5877(J)
diagnosis of, by differential uptake of I^{132}, 9: 1179(J)
diagnosis of, by early radioiodine uptake and renal excretion patterns, 9: 1463(J), 1464(J)
diagnosis of, by thyroidal uptake of I^{131}, 9: 3047
diagnosis, by uptake of I^{131}, counting method, 9: 46(J)
diagnosis of, by uptake of I^{131} following administration of desiccated thyroid, 9: 507(J)
histological changes in thyroid gland due to, identification, 9: 7244(J)
radiotherapy of, with I^{131}, prediction of uptake based on uptake of tracer dose, 9: 45(J)
therapeutic effects of I^{131} in treatment of hyperthyroidism and thyrotoxic myopathy, 9: 3749(J)
treatment of hyperthyroidism, effectiveness of I^{131} in, 9: 6155(R)
tumors treated with I^{131}, γ isodose measurements over entire body, 9: 2605(J)
uptake of I^{131} in carcinomas, 9: 500(J)
Thyroid gland
accumulation of At^{211} and I^{131} by, effects of KSCN and thyroxine on, 9: 1709(J)
accumulation of rhenium in, in rats, tracer study, 9: 5245
bibliography on, 9: 3004
carcinoma of, diagnostic and therapeutic use of I^{131} in, a review, 9: 5341(J)
carcinoma of, uptake of I^{131} by, evaluation, 9: 4685(J)
of cattle, radioactivity of, due to I^{131}, 9: 7249(R)
clearance of I^{131} by, 9: 2603(J)
destruction of, in rats by I^{131} compared to destruction of thyroid carcinoma, 9: 5855(J)
early uptake of I^{131} by, following intravenous administration, 9: 1463(J), 1464(J)
Thyroid gland (cont'd)
effect of radioinduced thyroidectomy on uptake of I^{131} by muscle and malignant melanoma tissue, 9: 3028(J)
effects of radiations from At^{211} and I^{131} on, in rats, 9: 5574(J)
evaluation of gland depth error in measuring uptake of I^{131} by, 9: 4681(J)
function, effects of thyrotropin on, in rats, tracer study, 9: 4690
growth characteristics and radioiodine uptake of autotransplanted and in situ lobes of, in rats, 9: 2543(J)
histological changes in, determination of those due to I^{131} and those due to other causes, 9: 7244(J)
human fetal uptake of iodine by, tracer study, 9: 4694(J)
improved tracer techniques for study of, 9: 1737(J)
influence of, upon pituitary tumors, 9: 6835(J)
influence of pituitary hormones on, in toads, 9: 2550
localization of protein-bound I^{131} in mouse, autoradiographic demonstration, 9: 1178(J)
metabolism, identification of products from, 9: 6900
metabolism of iodine by, effects of dietary fluorine on, tracer study, 9: 2610(J)
radioinduced changes in, effects of hypophysectomy and of thyroxine on, in rats, 9: 2113(J)
radioinduced deficiency of, effects on bond growth in mice, 9: 485(J)
removal of radioinduced destruction of, effects on induction of pituitary tumors, 9: 1450
report of symposium on, held at Brookhaven National Lab., 9: 3004
of salmon parr, effects of radiation from ingested I^{131} on, 9: 628(J)
uptake of iodine by, effect of diet, hypophysectomy, and TSH on, in dogs, tracer study, 9: 6175(J)
uptake of I^{131} by, effects of free iodide and of phenothiazine on, in rats, 9: 508(J)
uptake of I^{131} by, effects of injected thyrotropin, 9: 5578(J)
uptake of I^{131} by, effects of liver diseases on, 9: 499(J)
uptake of I^{131} by, of hypophysectomized rats, effects of direct and explant-transplants of anterior pituitary, 9: 1733(J)
Thyroxine
determination and separation by an ion exchange method, 9: 6900
distribution of, in rabbit brain, tracer study, 9: 2099(R)
effects of, on response to At^{211} in rats, 9: 7232(R)
effects of dietary, on dairy cows, 9: 1156(R)
effects on accumulation of At^{211} and I^{131} by thyroid gland, 9: 1709(J)
effects on radioinduced histologic changes in thyroid gland of rats, 9: 2113(J)
Thyroxine, triiodo-
distribution in rabbit brain, tracer study, 9: 2099(R)
Tidwell Quadrangle (Utah)
photogeologic map of, 9: 3159(J), 3834(J), 7769(J), 7770(J), 7771(J)
Timing circuits
design of, for Bevatron magnet pulsing, 9: 6379
design of, for half-life measurements, 9: 2951
design of, for meson decay experiments, 9: 303
time-delay analyzer, multi-channel recording, design of, 9: 1943
Tin
absorption of cosmic μ mesons, 9: 721
anion exchange separation, 9: 3109(J)
attenuation cross sections for 800-Mev protons, 9: 7172(J)
characteristic x-ray spectrum by β excitation, 9: 2950
chemical polishing, 9: 7990(P)
corrosion of, in 95°C, low-conductivity, aerated, distilled water, 9: 2725
cross sections for neutron transmission and multiplication, 9: 3646(J)
detection of, in presence of Al by colorimetric spot tests, 9: 1196

Tin (cont'd)
differential neutron elastic scattering cross sections at 4.1 Mev, 9: 4597(J)
diffusion of, in single crystals of Ag, tracer study, 9: 668(J)
electroforming from fluoborate baths, 9: 3495
energy loss of secondary electrons in a cavity with walls of, 9: 2045(J)
external bremsstrahlung emitted from P^{32} β rays stopped in, 9: 2505(J)
gamma penetration, tables and graphs, 9: 2472
gamma scattering cross section in, 9: 6043(J)
heats of solution of Cd–Ag alloys, Cd, Au, and Ag in liquid, 9: 4178
intermetallic compounds with Nb, Ta, and V, preparation and structure, 9: 3878(J)
iodometric determination of, in Nb–U ternary alloys, 9: 4074
neutron absorption and total cross sections at 1.4 Bev, 9: 5486(J)
neutron differential scattering cross sections at 3.7 Mev, 9: 4204(R)
neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)
neutron reactions (n,π^0), 400 Mev cross section, 9: 5742(J), 6011(J)
nuclear magnetic moments, 9: 2895
proton range in, 1- to 7-Mev, 9: 6788(J)
proton reactions (p,γ), 9: 1066(R)
proton stopping cross section, 9: 2026
radiochemical determination, 9: 876
separation and determination of, by electrochemical means, 9: 87(J)
solubility of, in $SnBr_2$, 9: 3052
spectra, isotope shift in, 9: 1415(J)
spectrographic determination in Bi, 9: 1475
spectrographic determination in Ti and Ti alloys, 9: 639(R)
spectrographic determination of, in ores and rocks, 9: 162
volume and grain boundary diffusion of, in Fe and Ni study of by radio-autography, 9: 7360(J)
volumetric determination of, in Sn–Zr alloy, 9: 6868
volumetric determination of, in Ti alloys, 9: 89(J)
volumetric determination of, in Ti and Ti alloys, 9: 4944
white-to-grey transformation in, effects of radiation on, 9: 5530(J)

Tin (liquid)
heat-transfer film coefficient of flowing, in graphite, 9: 139
solubility of Be in, 9: 5954

Tin–aluminum–titanium alloys
hardness, crystal structure, and phase studies, 9: 3520
high-temperature tensile properties of annealed sheet and bar, 9: 3198(J)
spot welded joints in, 9: 1839(R)

Tin–aluminum–titanium–vanadium alloys
fabrication and physical properties, 9: 2717(R)

Tin–aluminum–zinc alloys
corrosion of, in 95°C, low-conductivity, aerated, distilled water, 9: 2725

Tin–beryllium alloys
constitution diagrams, 9: 5954

Tin–bismuth alloys
changes in properties of, due to crystallization, 9: 4199(J)

Tin–bismuth–lead alloys
corrosive effects on metals at high temperatures, 9: 6659

Tin bromides (liquid)
solubility of Sn in, 9: 3052

Tin coatings
on steel, corrosion and weldability of, 9: 171

Tin compounds
organic, viscosity, 9: 5681(R)

Tin compounds (cont'd)
polarographic behavior of, in molten ammonium formate, 9: 7201

Tin–copper alloys
heats of formation and precipitation in, calorimetric investigation of, 9: 199(J)

Tin fluoride complexes
dissociation constants, 9: 4705(R)

Tin iodides
solubility of, in a perfluoroamine and a perfluoroether, 9: 95(J)

Tin isotopes Sn^{112}
energy levels, spacings and neutron widths of, 9: 6045(J)

Tin isotopes Sn^{114}
energy levels, spacings and neutron widths of, 9: 6045(J)

Tin isotopes Sn^{115}
energy levels, spacings and neutron widths of, 9: 6045(J)

Tin isotopes Sn^{116}
energy levels, spacings and neutron widths of, 9: 6045(J)

Tin isotopes Sn^{117}
angular correlations, 9: 4318
energy levels, spacings and neutron widths of, 9: 6045(J)
energy levels from decay of In^{117} and Sb^{117}, 9: 2056(J)

Tin isotopes Sn^{118}
energy levels, spacings and neutron widths of, 9: 6045(J)

Tin isotopes Sn^{119}
energy levels, spacings and neutron widths of, 9: 6045(J)

Tin isotopes Sn^{120}
energy levels, spacings and neutron widths of, 9: 6045(J)

Tin isotopes Sn^{122}
energy levels, spacings and neutron widths of, 9: 6045(J)
energy levels from Sb^{122} decay, 9: 4631(J)

Tin isotopes Sn^{124}
energy levels, spacings and neutron widths of, 9: 6045(J)

Tin–magnesium alloys
corrosion of, in 95°C, low-conductivity, aerated, distilled water, 9: 2

Tin–molybdenum alloys
martensitic transformations in, 9: 200(J)

Tin–molybdenum–zirconium alloys
specifications and properties, 9: 5556(P)

Tin–nickel alloys
surface tension, 9: 2702(R)
surface tension and wettability, 9: 7752(R)

Tin oxides
dielectric properties and solid-state reactions of, with binary, ternary, and quaternary systems of CaO, MgO, and TiO_2, 9: 3820(J)
heat and free energy of formation, 9: 529(J)

Tin–sodium alloys
electrochemical properties, 9: 7361(J)

Tin–titanium alloys
densities, melting points, and thermal and x-ray diffraction analyses of various phases in heat-treated, 9: 2281(R)
determination of the $\alpha + \beta$ phase in, 9: 7378(J)
hydrogen equilibrium pressure and temperature in single phase, 9: 2
volumetric determination of Sn in, 9: 89(J)

Tin–uranium alloys
effects of radiation, photomicrographic specimen for study of, 9: 2

Tin–zinc alloys
corrosion of, in 95°C, low-conductivity, aerated, distilled water, 9: 2

Tin–zirconium alloys
corrosion in water and aqueous media at 600 and 680°F, 9: 1
fabrication, 9: 1530(R)

Tin–zirconium alloys (cont'd)
high-temperature oxidation, 9: 5678(J)
multipass welds, embrittlement of, 9: 5655
preparation, fabrication, and effect of hot forming heat treatment on mechanical properties and grain size, 9: 966
volumetric determination, 9: 6868
Tissue cultures
Ehrlich tumor cells, physiology, 9: 5570
of excised anthers of Trillium, an evaluation of 8 media, 9: 3718(J)
growth, effects of electrons and x radiation, 9: 3016(J)
growth of, effects of nucleoprotein fractions from embryonic tissue, 9: 4726
of human bone-marrow cells, uptake of Fe^{59} and effects of irradiation, 9: 3011(J)
Tissue homogenates
adenosine triphosphatase activity in, effects of radiation, 9: 2587(J)
effects of, on radiosensitivity of amoeba, 9: 6820(R)
protective effects of, against radiation injuries, 9: 2600(J)
radiosensitivity effects of, in mice, 9: 37
radiosensitivity effects of injected, on survival of irradiated mice, 9: 4665
of spleen, effects of injected, on adenosine triphosphatase activity, spleen weight, and leukocyte count in irradiated mice, 9: 38(J)
spleen, effects of storage on protective effects against radiation injuries in mice, 9: 2594(J)
spleen, effects on radiation injuries in mice, 9: 2596(J)
of spleen and bone marrow, effects of treatment with enzymes and trypsin on radiation recovery factor, 9: 3370
Tissues
(See also specific tissues; see also Connective tissues; Placental tissues.)
absorption of x radiation by, 9: 2038(J)
from adrenal cortex, autotransplants of, effects of x irradiation on growth and histochemistry, in rats, 9: 22(J)
animal, chromatographic analysis of, for corticosteroids, 9: 3365
animal, sample preparation for chemical analysis, 9: 53
biochemistry of, effects of radiation on, 9: 2548(R)
calculated depth dose curves for broad beams of fast neutrons, 9: 4483
chromatographic determination of free amino acids in, 9: 5261
detection of Be in, by the $Be^9(\alpha, n\gamma)C^{12}$ reaction, 9: 4390(J)
determination of boron and boron compounds in, 9: 53
determination of sulfhydryl levels in, from rats, 9: 18
dose-energy function of, scintillation counter with response to neutrons equal to, 9: 6425(J)
effect of internal dose of ThO_2 on, 9: 5885(J)
fatty acid and glucose oxidation in, 9: 7669(J)
histopathology, and nucleic acid and other biochemical constituents of, effects of radiation on, in rats, 9: 490(R)
isolation of nucleoprotein fractions, 9: 4726
living, ionization of heavy nuclei from cosmic radiation in, 9: 3362
preparation of elastic, for electron microscopy, 9: 1707(J)
preparation of samples of thyroid, for codetermination of I^{127}, I^{131}, and At^{211}, 9: 1477
radiation dosage determinations in, 9: 3256(J)
radiosensitivity, factors affecting, 9: 3015(J), 6568(J)
skin and mesentery, mast cell counts in, effects of various treatments, 9: 3(R)
spectrophotometric analysis of, design of cuvettes for, 9: 7693
surface measurement of β activity in, in vivo, 9: 6(J)
transplanted mouse mammary carcinoma, growth, effects of preirradiation of tumor bed, 9: 4353(J)
Tissues (cont'd)
transplants of aorta and bone, effects of γ irradiation on, in dogs, 9: 1550(R)
Titanate compacts
refractory properties of Al titanate–Mg titanate or Al titanate–Fe titanate, 9: 3844(R)
Titanium
absorptiometric analysis of, for Mg, 9: 1198(J)
absorption of H by, 9: 7824
aircraft applications and mechanical properties, 9: 3200(J)
alloy weld joints in, improving toughness and strength of, 9: 235(J)
alloy welds in, mechanical properties and structure, 9: 2299
alloying valence and magnetic properties, 9: 5055
alpha, effects of Al, V, Mo, Cr, Mn, Si, O, N, and C as solid solutes in, 9: 6997(R)
alpha-β transformation in, effects of Al and Sn on, 9: 2329(J)
analysis, fabrication, metallurgy, and properties, 9: 2730
analysis and hydrogen embrittlement in, 9: 3183
analysis of, for Fe, Cr, Mo, and other elements, 9: 4944
analysis of, for H, 9: 3077(J), 5346
analytical chemistry, survey, 9: 7016(J)
beta, effects of Cr, Fe, V, Mn, and Mo, as solid solutes in, 9: 6997(R)
brazing and testing of brazed joints, 9: 4793(R)
casting and mechanical properties of as-cast and wrought, 9: 184
cathodic potential of, effect of fluorides on, in HF, 9: 7711(J)
cellular method for a close-packed hexagonal lattice, 9: 6690(J)
chemical analysis, review, 9: 4200(J)
chemical polishing, 9: 7990(P)
chemisorption of O and N on, 9: 7788
cladding of, to steel with Cr, Co, Fe, Mo, and Ni as bonding agents, 9: 4182
colorimetric determination of, in mixtures with Nb, 9: 6907(J)
combustion analysis of, for O, 9: 1197
combustion in air and O_2 and physical properties, 9: 3498(R)
commercial production, development, 9: 7817(J)
composition, availability, mill forms, alloy grades, forming, welding, and properties of, reference sheet for, 9: 3199(J)
container materials research, 9: 4780
corrosion, fabrication, and properties, and use in chemical industry, 9: 1542(J)
corrosion by Bi–Pb–Sn alloy at elevated temperatures, 9: 6659
corrosion by liquid Na, 9: 1904(R)
corrosion in fused salts, formation of pyrosols, 9: 1255(J)
corrosion in high-temperature waters, 9: 3459
corrosion resistance and applications, 9: 4202(J)
coupled to Al alloys and stainless steel, galvanic corrosion in H_2SO_4 solutions, 9: 3151(J)
creep and rupture behavior and tensile properties of, in temperature range 600 to 1000°F, 9: 1268
creep and rupture behavior at 600 to 1000°F, 9: 3483
creep of Ti 75A, 9: 168(R)
creep properties of, under intermittent stressing and heating conditions, 9: 3521
deposition of Cu on, by evaporation, 9: 7788
descaling and bright pickling, 9: 1838(R)
determination in Ti metals, 9: 5671(J)
determination of, in mixtures with Th, Zr, and Fe, by use of 2,4-dichlorophenoxyacetic acid, 9: 2641(J)
differential neutron elastic scattering cross sections at 4.1 Mev, 9: 4597(J)

Titanium (cont'd)
diffusion and vacuum extraction determination of H in, 9: 981(J)
diffusion of C in, 9: 1859
diffusion of N and O in, 9: 2339(J)
dissolution and passivation of, in acids in presence of NH_4F, 9: 2146(J)
dissolution of, in acids, 9: 2783(J)
drop-hammer stamping and forming with trapped rubber, 9: 1847(R)
ductility and deformation resistance, temperature effects, 9: 5967(J)
electrochemical reduction, number of electrons in, 9: 6603(J)
electrodeposition from aqueous solutions, 9: 4808
electrodeposition from non-aqueous solutions, 9: 6291
electrodeposition of, from aqueous, nonaqueous, and fused-salt electrolytes, 9: 1895
electrodeposition of, from Ti/fused salt/Pt cell, 9: 3067(J)
electrodeposition of, on base metals, 9: 4183
electron diffraction analysis of, treated with HCl, HF, H_2SO_4, HNO_3 and H_3PO_4, 9: 5970(J)
electron emission from, and Cu coated Ti, 9: 7788
electroplating and roll-bonding of, with Ni, Fe, and Cr, 9: 3477(R)
embrittlement in atmospheres of H_2, O_2, N_2, and air of ceramic coated and uncoated, at 1500 and 1700°F, 9: 1880(J)
extrusion, effect of temperature and die design on, microstructure, 9: 6292
fabrication, mechanical properties, and fatigue and stress testing, 9: 5064
fabrication and mechanical properties, 9: 3858
fatigue, effect of internal heating on, 9: 1533
fatigue, effects of rolling and grinding on, 9: 962(R)
fatigue behavior of spot-welded joints in, 9: 1849(R)
fatigue and mechanical properties, effect of repeated loading on, 9: 977
fatigue properties of Ti-75A, effects of surface treatment, 9: 3842(R)
formation and removal of twins in, during deformation, 9: 2324(J)
friction testing of halogenated hydrocarbon lubricated, 9: 961(R)
fusion welded, for B-36 aircraft, conference on, 9: 7790
fusion welding, 9: 5369(J)
galling, sliding friction, and interface temperature, 9: 1271
galling and seizing of, by friction coefficients, 9: 1269
galling and seizing in, prevention of, 9: 2745(J)
general physical metallurgy, a review of, 9: 2750(J)
grain growth on recrystallized arc-melted sponge Ti-75A, 9: 3872(R)
grain size, effects of annealing on, 9: 1847(R)
hardening, mechanical testing, nitridation, and wear resistance, 9: 5665
hardening of solid solution, 9: 6997(R)
hardness, 9: 3854(R)
hardness, microstructure, and tensile properties of parent stock and welded, 9: 968
heat capacities, 9: 5077
high-temperature alloy fusion brazing of, 9: 645(J)
history, production, properties, metallurgy, and uses, seminar on, 9: 1281(J)
impact properties of arc-melted, 9: 2717(R)
inert-gas welding of, for aircraft parts, 9: 6301(J)
ion bombardment cleaning of, determined by electron diffraction, 9: 7788
in iron and steel, book on, 9: 7385(J)
loading with deuterium, apparatus for, 9: 5280(R)
lubricants, 9: 4466(J)
machining, control of materials, tools, and machines in, book on, 9: 208(J)
machining and grinding, 9: 4174
machining and metallurgical properties, 9: 7346
Titanium (cont'd)
mechanical properties, effect of H on, 9: 1857, 2749(J)
mechanical properties, effect of alloying elements, 9: 3539(J)
mechanical properties, effects of grain size on, 9: 1837(R)
mechanical properties, effects of grain size and heat treatment on, 9: 3492(R)
mechanical properties and microstructure, effects of heat treatment on, 9: 2304(J)
mechanical properties and wear resistance, effect of nitridation on, 9: 7787(R)
mechanical properties and microstructure of extruded and heat treated, effects of temperature, pressure, and die angle on, 9: 2276(R)
mechanical properties and oxidation, effects of ceramic coatings and heat treatment on, 9: 4461
mechanical properties of commercially pure, effect of low temperature on, 9: 3205(J)
mechanical properties of weld joints in unalloyed, 9: 215(J)
mechanical properties of welded, 9: 1859
melting and casting, 9: 3847
metallurgical evaluation of Al_2O_3, BeO, ZrO_2, ThO_2, and Gd_2O_3 crucibles for molten, 9: 2246
metallurgical evaluation of Ti, Zr, and Cr boride and Ce sulfide crucibles for molten, 9: 2248
metallurgy, bibliographies, 9: 7002
microstructure, 9: 3868
microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed and cold worked, 9: 2296
microstructure and hardness of spot and arc welds of Ti-75A, 9: 3493(R)
molybdenum coated, wear resistance, 9: 2752(J)
neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)
neutron total cross sections, 9: 5423, 7124(J)
oxidation and impact strength of, effects of ceramic coatings and heat treatment on, 9: 3868
oxidation of, under conditions of linear temperature increase, 9: 181
oxidation of oxygen-free and oxygen-saturated, between 800 and 1200°C, 9: 4377(J)
penetration of liquid, into graphite, 9: 6673(J)
permeability and mechanical properties, conference, 9: 2284
permeability to nitrogen, 9: 978(R)
phase structures of heat-treated, 9: 2279(R)
physical properties and effects of alloying metals on, 9: 2738(R)
plastic deformation and preferred orientation, 9: 1836(R)
plastic flow, slip, and twinning in coarse-grained sponge and iodide Ti-75A from −196 and 800°C, 9: 3872(R)
polarization of, in 3% NaCl solution, 9: 2259(J)
polarographic behavior and determination of, in H_2SO_4, 9: 538(J)
polarographic determination of, evaluation of m-nitrophenylarsonic acid as reagent for, 9: 4735(J)
powder metallurgy, 9: 7785
powder metallurgy, review, 9: 2302(J)
preparation, 6263(R)
preparation by electrolysis of K_2TiF_6, 9: 5365(J)
preparation by nonconsumable and consumable electrode arc melting, 9: 2293(R)
processing and corrosion properties, review, 9: 7370(J)
processing and reuse of Ti scrap, 9: 7347
production, chemical engineering aspects of, 9: 647(J)
production, metallurgy, and properties, 9: 2286, 2287, 2288, 2289, 2291, 2292
produced by non-kroll process electron-diffraction analysis, 9: 6306(J)

Titanium (cont'd)
production by electrolytic reduction of TiO, 9: 4475(J)
properties and reactor applications, 9: 6476
properties required of, in airframe application, 9: 7356
purity, properties, heat treatment, fabrication, welding, machining, and cleaning, book, 9: 1892(J)
radioactivity induced in by pile radiation, 9: 6105
reaction of, with red-fuming nitric acid, accident report, 9: 3456(J)
reaction with fused NaOH, 9: 1466(R)
recrystallization diagram, 9: 5069(J)
relaxation, equipment for testing, 9: 3505(R)
relaxation of, effect of microstructure on, 9: 3506(R)
resistance sintering under pressure, 9: 1878(J)
resistance spot and inert arc welding, 9: 988
roll and electrolytic cladding of steel with, 9: 3477(R)
scaling, effect of alloying elements on, 9: 6263(R)
scaling data, 9: 4790(R)
separation from O by vacuum sublimation, 9: 2209(J)
separation and spectrophotometric determination of, in steel, 9: 1199(J)
separation of, by anion exchange, 9: 912(J)
silver brazing, metallurgical aspects of, 9: 7362(J)
slip modes, occurrence during tensile deformation, 9: 643(J)
spectrographic analysis for B, Fe, V, Al, Cr, Sn, Co, and W, 9: 639(R)
spectrographic determination of, in ores and rocks, 9: 162
spectrophotometric determination of, in ores, 9: 3405(J)
spectrophotometric determination of trace amounts of, in uranyl nitrate, 9: 6199(J)
spot welded joints in, 9: 1839(R)
spot-welded joints in, behavior in fatigue, 9: 5040(R)
spot welding of, 9: 224(J)
strength, effects of oxidation and temperature, 9: 2282(J)
surface friction, 9: 3487(R)
surface hardening with metalloid elements, 9: 5665
surface protection of, during heat treatment, 9: 5071(J)
surface treatment of, for oxidation protection, symposium on, 9: 2283
technology, handbook, 9: 4813(J)
tensile and notched impact tests on hot-rolled and annealed Ti-75A, 9: 3872(R)
tensile properties, 9: 3521
tensile properties, recrystallization, and grain growth of Ti-75A, 9: 3873(R)
tensile properties, welding, and galling, 9: 3843(R)
tensile properties at room temperature, effects of creep test conditions on, 9: 2275(R)
tensile properties and ductility, 9: 1848(R)
tensile properties of, effects of C, O, and H on, 9: 5667
tensile properties of forged and welded, 9: 1529
tensile properties of seamwelded, 9: 1838(R), 1847(R)
thermal expansion, 9: 1266
transition temperatures of iodide, 9: 175(R)
vacuum etching of, in high temperature β phase, 9: 2757(J)
vapor deposition of Mo on, 9: 2752(J)
welding, effects of H, O, N, and C on, 9: 7782(R)
welding without filler rod, properties of weld produced by, 9: 3197(J)
welds, static and fatigue properties, 9: 5370(J)
wetting with Hg, 9: 2766(J)
wetting with Na silicate glass, 9: 6646(R)
Titanium (cont'd)
x-ray spectra (soft), 9: 452(J)
Titanium alloys
absorptiometric analysis of, for Mg, 9: 1198(J)
analysis, fabrication, metallurgy, preparation, and properties, 9: 2730
analysis and hydrogen embrittlement in, 9: 3183
analysis of, for Fe, Cr, Mo, and other elements, 9: 4944
analysis of, for H, 9: 3077(J), 5346
analysis of, for Ti, 9: 5671(J)
analytical chemistry, survey, 9: 7016(J)
binary, analysis of quench products and mechanism of tempering in various, 9: 1842(R)
casting and forging for gas turbine application, 9: 3869
chemical and spectrographic analysis, 9: 3518
colorimetric analysis of, for Si, 9: 2632
combustion analysis of, for O, 9: 1197
corrosion resistance and applications, 9: 4202(J)
creep and rupture, effects of structure, hardness, sponge hardness, and H on, 9: 7783(R)
creep and rupture behavior and tensile properties of, in temperature range 600 to 1000°F, 9: 1268
creep and rupture behavior at 600 to 1000°F, 9: 3483
design of an electrostatic apparatus for dynamic elastic moduli determinations, 9: 2293(R)
development of all-α sheet, 9: 2717(R)
fabrication, mechanical properties, and fatigue and stress testing, 9: 5064
fabrication by powder metallurgical treatment, 9: 7785
fatigue, effect of internal heating on, 9: 1533
fatigue, effects of rolling and grinding on, 9: 962(R)
fatigue tests of seam-welded, 9: 3500
forging in inert gas, 9: 984(J)
formability tests on, 9: 7355
galling, sliding friction, and interface temperature, 9: 1271
grain structure, phase studies, and mechanical properties, 9: 6997(R)
growth of nitrided, 9: 978(R)
hardening, effect of alloying elements on, 9: 5353
hardness and phase studies, 9: 3524
heat treatment, mechanical properties, and phase studies, symposium, 9: 4795
of high strength and toughness, fabrication, mechanical properties, and transformation temperatures, 9: 5964(R)
high-temperature alloys fusion brazing of, 9: 645(J)
high-temperature application, mechanical properties, and preparation, 9: 5343(R)
high-temperature properties, effects of alloying elements on, 9: 7357(R)
hydrogen contaminated-, mechanical properties and heat treatment effect, 9: 4467(J)
hydrogen removal by vacuum-diffusion annealing, effect on ductility of heat-treated, 9: 1845(R)
lubricants, 9: 4466(J)
machinability of Ti alloys RC-110A abd 3Al–5Cr, 9: 4810
machining and grinding, 9: 4174
machining, control of materials, tools, and machines in, book on, 9: 208(J)
machining of Ti-150A, dynamometer measurements as aid for, 9: 2779(J)
mechanical properties, conference, 9: 2284
mechanical properties, effect of alloying elements, 9: 3539(J)
mechanical properties, effect of C, N, and O on, 9: 7004(R)
mechanical properties, effect of heat treatment on, 9: 7789

Titanium alloys (cont'd)
mechanical properties, effects of microstructure on, 9: 4176, 4177
mechanical properties and creep of heat-treated iodide and sponge, at room and elevated temperatures, 9: 1845(R)
mechanical properties and microstructure of α, β, and α' phases, effects of composition and heat treatment on, 9: 2304(J)
mechanical properties and wear resistance, effect of nitridation on, 9: 7787(R)
melting and casting, 9: 3847
metallurgy, bibliographies, 9: 7002
metallurgy and properties, 9: 1267(R), 2286, 2287, 2288, 2289, 2290, 2291, 2292
molybdenum coated, wear resistance, 9: 2752(J)
nephelometric and gravimetric analysis of, for small amounts of Ca, 9: 4942
physical properties, 9: 2738(R)
physiochemical properties, effects of solute valency on, 9: 5055
polarographic analysis of, for Cr and Fe, 9: 6290
preparation, rolling, and welding, 9: 7004(R)
preparation and scaling, 9: 6263(R)
production, properties, history, metallurgy, and uses, seminar on, 9: 1281(J)
properties and reactor applications, 9: 6476
preparation of, with added Al, Cr, Mn, C, Fe, N, and W, 9: 3518
properties of commercial, 9: 1892(J)
quenching, severity of various mediums for, 9: 5958
relaxation, effect of microstructure on, 9: 3506(R)
relaxation behavior, 9: 7350
relaxation behavior and tensile properties of, 9: 1856(R), 3176(R), 5659(R)
scaling data, 9: 4790(R)
spectrographic analysis for B, Fe, V, Al, Cr, Sn, Co, and W, 9: 639(R)
spectrophotometric analysis of, for Fe, 9: 84(J)
spot-welded joints in, fatigue behavior, 9: 3491(R), 5340(R)
surface friction, 9: 3487(R)
technology, handbook, 9: 4813(J)
tensile properties, effects of temperature on, 9: 5960
tensile properties of forged and welded, 9: 1529
tests of physical properties, 9: 7354
vapor deposition of Mo on, 9: 2752(J)
welding, effect of alloying elements on, 9: 5375(J)
welding and preparation, 9: 7005
welding by inert-gas W-arc process, 9: 6302(J)
welds, effect of O and N contamination levels on, 9: 226(J)
welds, static and fatigue properties, 9: 5370(J)
welds, mechanical properties and structure, 9: 2299
Titanium–aluminum alloys
alpha-β phase in, determination of, 9: 7378(J)
alpha phase, hydrogen equilibrium pressure and concentration in, 9: 2329(J)
casting and mechanical properties of as-cast and wrought, 9: 184
casting and powder metallurgy, 9: 3849(R)
creep and rupture behavior at 600 to 1000°F, 9: 3483
creep and tensile properties of as-forged, effect of structure on, 9: 2279(R)
creep deformation of, 9: 175(R)
creep-rupture tests in He atmosphere, 9: 5341(R)
fabrication, heat treatment, and effect of microstructure on mechanical properties of, 9: 178
fabrication, mechanical properties, oxidation, and powder metallurgy, 9: 3520
Titanium–aluminum alloys (cont'd)
hot-rolled textures and deformation mechanisms of, 9: 1836(R)
heat of formation, 9: 7814(J)
metallurgical properties, survey, 9: 3822(J)
high-temperature tensile properties and microstructure, effects of heat treatment on, 9: 2719(R)
lattice parameter, resistivity, magnetic susceptibility, and other physical properties, 9: 5055
mechanical properties and microstructure of flash-welded, 9: 965
mechanical properties of, effects of structure and composition on, 9: 201(J)
melting techniques and forging temperatures for preparation of, 9: 188
metallurgical properties, 9: 3475
microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296
nature of quench transformation in, 9: 1844(R)
occupation of lattice sites in the AlTi phase, effects of Al on, 9: 1516(J)
phase studies, bend ductility, tensile properties, hardness, microstructures of as-rolled and heat-treated welded and unwelded, 9: 3493(R)
preparation by nonconsumable and consumable electrode arc melting, 9: 2293(R)
room-temperature dynamic elastic modulus and its ratio to density, 9: 2726(R)
strength, effects of temperature, 9: 2282
tensile, bend, and hardness properties of as-rolled and heat-treated welded and unwelded, 9: 3499(R)
tensile properties at room-temperature, effects of creep test conditions on, 9: 2275(R)
welding and mechanical properties, effect of alloying elements on, 9: 3854(R)
Titanium–aluminum–carbon systems
mechanical properties, 9: 3854(R)
Titanium–aluminum–carbon–vanadium systems
tensile properties, 9: 3853(R)
Titanium–aluminum–chromium alloys
high-temperature tensile properties and microstructure, effects of heat treatment on, 9: 2719(R)
fabrication, 9: 1534(R)
fabrication and physical properties, 9: 2717(R)
fabrication of joints by pressure welding, 9: 5974(J)
hardness, crystal structure, and phase studies, 9: 3520
hardness, heat treatment, and microstructure, 9: 4186
impact strength and hardness of weld thermal-cycled heat-affected zone of, 9: 1531
microstructure and continuous cooling transformation of, 9: 1531
transformation characteristics, microstructure, heat treatment, and mechanical properties, 9: 4807(R)
Titanium–aluminum–chromium–iron–molybdenum alloys
preparation and properties, 9: 3490(R)
Titanium–aluminum–chromium–molybdenum alloys
phase structures and tensile properties of as-produced, 9: 2279(R)
Titanium–aluminum–chromium–nickel alloys
surface chemistry of oxidized, 9: 2747(J)
Titanium–aluminum alloys
preparation of homogenous γ, 9: 3850(R)
Titanium–aluminum–indium alloys
hardness, crystal structure, and phase studies, 9: 3520
Titanium–aluminum–iron alloys
fabrication and physical properties, 9: 2717(R)
hardness, crystal structure, and phase studies, 9: 3520
Titanium–aluminum–manganese alloys
analysis of, for H, 9: 3077(J)

Titanium–aluminum–manganese alloys (cont'd)
casting and mechanical properties of as-cast wrought, 9: 184
compression properties and microstructure, 9: 3475
fabrication, heat treatment, phase studies, mechanical properties, microstructure, and aging characteristics, 9: 1856(R)
hardness, crystal structure, and phase studies, 9: 3520
high-temperature tensile properties of annealed sheet and bar, 9: 3198(J)
machining and grinding, 9: 4174
mechanical properties and microstructure of flash-welded, 9: 964
phase studies and microstructure, 9: 1873(J)
transformation characteristics, microstructure, heat treatment, and mechanical properties, 9: 4807(R)
transformation temperatures, age hardening, heat treatment, and mechanical properties, 9: 1534(R)

Titanium–aluminum–molybdenum alloys
creep and tensile properties of as-forged and heat-treated, effect of structure on, 9: 2279(R)
hardness, crystal structure, and phase studies, 9: 3520
high-temperature tensile properties and microstructure, effects of heat treatment on, 9: 2719(R)
melting techniques and forging temperatures for preparation of, 9: 1850(R)

Titanium–aluminum–nickel alloys
hardness, crystal structure, and phase studies, 9: 3520
preparation, sintering, density, resistivity, percent O_2, stress rupture, and impact strength of hot-pressed, 9: 3165(R)
stress-ruptured of sintered, 9: 3850(R)

Titanium–aluminum–niobium alloys
oxidation, 9: 3849(R)

Titanium–aluminum–nitrogen systems
mechanical properties, 9: 3854(R), 4789(R)

Titanium–aluminum oxide systems
hardness and microstructure, 9: 2246
powder metallurgy, 9: 3496

Titanium–aluminum–oxygen systems
high-temperature tensile properties and microstructure, effects of heat treatment on, 9: 2719(R)
mechanical properties, 9: 3854(R), 4789(R)

Titanium–aluminum–silicon systems
hardness, crystal structure, and phase studies, 9: 3520
high-temperature tensile properties and microstructure, effects of heat treatment on, 9: 2719(R)
melting techniques and forging temperatures for preparation of, 9: 1850(R)
phase studies and hardness of, 9: 1843(R)
tensile properties of as-forged, 9: 2279(R)
transformation temperatures, age hardening, heat treatment, and mechanical properties, 9: 1534(R)

Titanium–aluminum–silver alloys
oxidation, 9: 3849(R)

Titanium–aluminum–tantalum alloys
hardness, crystal structure, and phase studies, 9: 3520
oxidation, 9: 3849(R)

Titanium–aluminum–tin alloys
hardness, crystal structure, and phase studies, 9: 3520
high-temperature tensile properties of annealed sheet and bar, 9: 3198(J)
spot welded joints in, 9: 1839(R)

Titanium–aluminum–tin–vanadium alloys
fabrication and physical properties, 9: 2717(R)

Titanium–aluminum–vanadium alloys
aging characteristics and tensile, bend, and hardness properties of as-rolled and heat treated welded and unwelded, 9: 3499(R)
electroplating and tensile properties, 9: 3853(R)
fabrication, by powder metallurgical treatment, 9: 7785
fabrication, heat treatment, and effect of section size on mechanical properties, 9: 1534(R)
hardness, crystal structure, and phase studies, 9: 3520
hardness of, water quenched from 1000°C, 9: 1842(R)
heat treatment, mechanical properties, microstructure, and phase studies, 9: 7000
high-temperature tensile properties and microstructure, effects of heat treatment on, 9: 2719(R)
melting techniques and forging temperatures for preparation of, 9: 1850(R)
partial isothermal sections of, at 800, 900, 1000, and 1200°C, 9: 1843(R)
phase studies, 9: 1844(R)
tensile strength, yield strength, and bendability, effects of heat treatment on, 9: 5656(R)

Titanium–aluminum–zirconium alloys
hardness, crystal structure, and phase studies, 9: 3520
impact testing, presintering and sintering and stress-rupture testing of sintered, 9: 3850(R)

Titanium arsenides
crystal structure and phase studies, 9: 3064(J)

Titanium–beryllium oxide systems
hardness and microstructure, 9: 2246

Titanium boride–chromium–molybdenum systems
refractory properties, 9: 4137(R)

Titanium boride–niobium boride systems
preparation and properties, 9: 6957(J)

Titanium borides
diffusion into NbB_2, reciprocal, 9: 5320(J)
metallurgical properties, survey, 9: 3822(J)
preparation by vacuum technique, 9: 1821(J)
properties of, effect of molten Ti on, 9: 2248
reactions with C and N_2, equilibria studies, 9: 5677(J)

Titanium borohydrides
preparation and electrolysis in non-aqueous solutions, 9: 6291

Titanium carbide–nickel compacts
mechanical properties of, 9: 1820(R)
properties, effects of impurities on, 9: 5643
vibratory compacting, 9: 4173(R)

Titanium carbide–nickel systems
impact and stress-rupture testing, 9: 4991(R)
microstructure, effect of ball-milling, pressing, and sintering on, 9: 2756(J)
properties, effects of additions of O and Mo_2C on, 9: 4992(R)

Titanium carbide systems
compression-creep properties, 9: 3504(R)

Titanium carbides
metallurgical evaluation of C, graphite, and Nb, Ta, W, Ti, V, and Zr carbide crucibles for molten, 9: 2247
metallurgical properties, survey, 9: 3822(J)
microstructure, 9: 2756(J)
powder metallurgy and properties, 9: 2703(R)
preparation, 9: 6250(J)
preparation of, for microscopic study, 9: 5073(J)
properties, effect of molten Ti on, 9: 2247

Titanium carbides (cont'd)

properties, effects of additions of O and Mo_2C on, 9: 4992(R)

properties, effects of impurities on, 9: 5643

purification of, by flotation of C, 9: 2703(R)

reaction of Th with, at high temperatures, 9: 1247

reactions of, with Fe, Ni, Mo, Si, Nb, Ti, and Zr at 1600° to 1800°C, 9: 3821(J)

solid solubility of Cr_3C_2 in, 9: 6259(J)

thermal expansion, 9: 4991(R)

Titanium–carbon–manganese systems

fabrication, heat treatment, phase studies, mechanical properties, microstructure, and aging characteristics, 9: 1856(R)

heat treatment, mechanical properties, microstructure, and phase studies, 9: 180(R)

phase studies and microstructure, 9: 1873(J)

Titanium–carbon–molybdenum systems

forging in inert gas, 9: 984(J)

grain growth and size, microstructure, phase studies, and tensile properties of heat-treated, 9: 975

phase studies and preparation, 9: 5359

Titanium–carbon–nickel systems

microstructure and phase studies, 9: 3457

Titanium–carbon–oxygen systems

mechanical properties, microstructure, and phase studies, 9: 1870(J)

Titanium–carbon–silicon systems

constitution diagrams, 9: 4187, 4704

Titanium–carbon systems

elastic modulus and its ratio to density, 9: 2728(R)

mechanical properties, microstructure, and phase studies, 9: 1870(J)

mechanical properties of welded, 9: 1859

microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296

phase studies, vacuum annealing, machinery, and combustion determination of C in, 9: 1859

preparation, double inert-gas arc melting, forging, and welding, 9: 3489(R)

preparation by nonconsumable and consumable electrode arc melting, 9: 2293(R)

size of interstitial solute atoms, lattice expansion, and electronic properties of close-packed, 9: 1780(J)

tensile properties in the temperature range -196 to 515°C, 9: 5667

Titanium chlorides

disproportionation and vapor pressure, 9: 2628(J)

enthalpy of formation, 9: 2292

force constants, calculations, 9: 7964(J)

force constants, infrared spectrum, and thermodynamic properties, 9: 7962(J)

heat of formation, 9: 1185(J)

heat of formation and entropy, 9: 2290

infrared spectroscopic determination of impurities in, 9: 920(J)

mass spectrum of $TiCl_4$, 9: 291(J)

mixtures with heptane, total pressure from 25 to 80°C, 9: 1751(J)

preparation of, by reduction of $TiCl_4$ with H, 9: 2630(J)

preparation of $TiCl_3$ in inert atmosphere, 9: 6291

thermodynamic properties, 9: 2626(J)

Titanium–chromium alloy–chromium couples

diffusion coefficients, 9: 2739

Titanium–chromium alloys

ductility, tensile properties, and effects of composition and stabilizing treatments on stability, 9: 5344(R)

fabrication, 9: 2326(J)

grain-boundary diffusion in, as bonding agent between Ti and steel, 9: 4182

hardness, heat treatment, and microstructure, 9: 4186

hardness and phase studies, 9: 1843(R)

high-temperature tensile properties and microstructure, effects of heat treatment on, 9: 2719(R)

phase structure and tensile properties of as-forged and heat-treated, 9: 2279(R)

powder preparation, microstructure, and x-ray-diffraction patterns, 9: 3841(R)

precipitation hardening, heat treatment, and embrittlement of high-strength, 9: 4462

preparation, corrosion, physical properties, and testing, 9: 2740

tensile properties, 9: 3486(R)

x-ray density as a function of Cr and oxidation as a function of density and composition, 9: 3841(R)

Titanium–chromium couples

diffusion coefficients, 9: 2739

Titanium–chromium–iron alloys

creep of heat-treated and as-received, at 76 and 600°F, 9: 3478(R)

creep of hot-rolled and annealed, at 76 and 600°F aging effects on, 9: 3479(R)

creep of Ti 150A, 9: 168(R)

drilling tests, 9: 3544(J)

machining and grinding, 9: 4174

machining characteristics of forged Ti-150A, 9: 4168

tensile properties and rupture at 800°F of hot-rolled, 9: 2275(R)

tensile properties at room temperature, effects of creep test conditions on, 9: 2275(R)

tensile properties of heat-treated and hot-rolled, effects of creep testing on, 9: 2279(R)

Titanium–chromium–iron–manganese–molybdenum alloys

mechanical properties and microstructure of extruded and heat treated, effects of temperature, pressure, and die angle on, 9: 2276(R)

Titanium–chromium–iron–manganese–molybdenum–vanadium alloys

heat treatment, mechanical properties, phase studies, tensile properties, and welding, 9: 2298

tensile properties, hardness, and flash weldability, 9: 3856

Titanium–chromium–iron–molybdenum alloys

tensile properties and ductility, 9: 1848(R)

Titanium–chromium–manganese alloys

grain structure, hardness, heat treatment, mechanical properties, phase studies, and welding, 9: 2298

Titanium–chromium–manganese–molybdenum alloys

microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296

Titanium–chromium–molybdenum alloys

ductility, tensile properties, and effects of composition and stabilizing treatments on stability, 9: 5344(R)

effects of grain size and heat treatment on, mechanical properties, 9: 3492(R)

mechanical properties, effects of grain size on, 9: 1837(R)

Titanium–chromium–nitrogen systems

electrical resistance of films of, 9: 2345(J)

Titanium–chromium–oxygen systems

corrosion, impact tests, mechanical properties, phase studies, properties, and x-ray diffraction analysis, 9: 5654(R)

oxidation resistance, hardness, and tensile strength, 9: 4791(R)

phase studies, 9: 1874(J)

Titanium–chromium–vanadium alloys

constitution diagrams and mechanical properties, 9: 4187

hardness, heat treatment, mechanical properties, phase studies, and welding, 9: 2298

Titanium coatings

deposition on Cu, Fe, and carbon steel from pyrosols, 9: 2307(J)

preparation by electrodeposition, 9: 4183

Titanium–cobalt alloys

grain boundary diffusion in, as bonding agent between Ti and steel, 9: 4182

powder preparation, microstructure, and x-ray-diffraction patterns, 9: 3841(R)

Titanium compounds

organo-, chemistry, review, 9: 6093(J)

polarographic behavior of, in molten ammonium formate, 9: 7292

Titanium conferences

on diffusion and mechanical properties of Ti, held at Columbia Univ. June 9 and 10, 1954, 9: 2284

on hydrogen embrittlement in α-β Ti alloys, 9: 3183

on materials and design for light-weight construction, 9: 1281(J)

minutes of Ti symposium held at Battelle Memorial Institute on Dec. 7 and 8, 1954, 9: 4795

on surface treatment of Ti held at Armour Research Foundation, Chicago, on Jan. 28, 1953, 9: 2283

Titanium–copper alloys

elastic modulus and its ratio to density, 9: 2728(R)

heat treatment, mechanical properties, and microstructure, 9: 1875(J)

preparation by nonconsumable and consumable electrode arc melting, 9: 2293(R)

Titanium crystals

yield phenomena, kink bands, and geometric softening in, 9: 3187(J)

Titanium fluorides

x-ray diffraction analysis of TiF_3, TiF_4, and $TiOF_2$, 9: 3787(J)

Titanium–gadolinium oxide systems

hardness and microstructure, 9: 2246

Titanium–gallium alloys

lattice parameter, resistivity, magnetic susceptibility, and other physical properties, 9: 5055

Titanium–germanium alloys

preparation, constitution diagrams, and heat treatment, 9: 6297(J)

Titanium–hydrogen–nitrogen systems

preparation and constitution diagrams, 9: 4187

Titanium–hydrogen systems

microstructure, 9: 1857

tensile properties in the temperature range -196 to 515°C, and preparation, 9: 5667

Titanium hydroxides

colloid suspensions, electrolyte effects on surface of, 9: 1193(J)

Titanium–iron alloys

electric resistance, phase studies, and microstructure of heat-treated, 9: 975

grain boundary diffusion in, as bonding agent between Ti and steel, 9: 4182

heat of formation, 9: 7814(J)

Titanium–iron alloys (cont'd)

martensite formation and hardness in powders and lump specimens of, 9: 1547(J)

mechanical properties, effect of microstructure, 9: 4172

oxygen content and oxide phase equilibrium with, 9: 1546(J)

precipitation hardening, heat treatment, and embrittlement of high-strength, 9: 4462

Titanium–iron–molybdenum alloys

hardness, heat treatment, mechanical properties, phase studies and welding, 9: 2298

Titanium–iron–oxygen systems

phase studies, 9: 1874(J)

Titanium–iron–vanadium alloys

fabrication and physical properties, 9: 2717(R)

microstructure, hardness, and tensile properties of welded and unwelded, 9: 3493(R)

Titanium isotopes

relative abundances of, from mass-spectrometric analysis of $TiCl_4$, 9: 291(J)

Titanium isotopes Ti^{44}

deuteron reactions (d,p), angular distributions and Ti^{47} spin and parity assignments from, 9: 7550(J)

gamma-gamma directional correlation, 9: 4897(J)

lifetimes of excited states, upper limit to, 9: 7915(J)

Titanium isotopes Ti^{47}

Coulomb excitation functions and energy levels for, bombarded with 3.5-Mev α particles, 9: 423(J)

spin and parity assignments of 1.4-Mev state from angular distribution measurements of Ti^{46} (d,p) reaction, 9: 7550(J)

Titanium isotopes Ti^{48}

deuteron reactions (d,p), angular distribution, 9: 2020(J), 7550(J)

gamma spectrum and decay scheme in isobaric triplet Cr^{48}–V^{48}–Ti^{48}, 9: 6056(J)

Titanium isotopes Ti^{49}

ground and excited states of, from Ti^{48} (d,p) reaction, 9: 2020(J)

Titanium isotopes Ti^{51}

decay, 9: 1675(J), 3687(J), 6458(J)

decay schemes, 9: 988(R)

Titanium–lead alloys

preparation and phase studies, 9: 1872(J)

Titanium–magnesium alloys

constitution diagrams, 9: 2761(J)

compressive, bearing, and shear creep-rupture properties of, at elevated temperatures, 9: 5361

extrusion, effect of temperature and die design on, 9: 6292

heat treatment, 9: 3486(R)

Titanium–magnesium oxide systems

powder metallurgy, 9: 3496

Titanium–manganese alloys

analysis of, for H, 9: 3077(J)

casting and mechanical properties of as-cast and wrought, 9: 184

creep of as-received and heat-treated, at 76, 210, 400, and 600°F, aging effects on, 9: 3479(R)

creep of heat-treated and as-received, at 76, 210, 400, and 600°F, 9: 3478(R)

creep of RC-130A, 9: 168(R)

electric resistance, microstructure, phase studies, and impact and tensile properties of heat-treated, 9: 975

fabrication and mechanical properties, 9: 3658

hardness, heat treatment, and microstructure, 9: 4186

Titanium–manganese alloys (cont'd)

hardness and microstructures of welded RC-130A, 9: 3493(R)

heat treatment, tensile properties, and impact tests, 9: 4787

heat treatment response, effect of α solutes on, 9: 1873(J)

high-temperature tensile properties of annealed sheet and bar, 9: 3196(J)

impact strength and hardness of weld-thermal-cycled heat-affected zone, 9: 4801

machining and grinding, 9: 4174

mechanical properties, effect of H on, 9: 1857

microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296

microstructure and continuous cooling transformation, 9: 4801

phase studies, bend ductility, and tensile strength of welded and unwelded RC-130A, 9: 3493(R)

phase studies and physical properties, 9: 1528

precipitation hardening, heat treatment, and embrittlement of high-strength, 9: 4462

spot welded joints in, 9: 1839(R)

tensile properties, 9: 1848(R)

transformation characteristics, microstructure, heat treatment, and mechanical properties, 9: 4807(R)

welding of RC-130A, effect of heat treatment and surface contamination on, 9: 227(J)

welds, static and fatigue properties, 9: 5370(J)

Titanium–manganese–nitrogen systems

fabrication, heat treatment, phase studies, mechanical properties, microstructure, and aging characteristics, 9: 1856(R)

phase studies and microstructure, 9: 1873(J)

Titanium–molybdenum alloys

creep and rupture behavior at 600 to 1000°F, 9: 3483

creep and tensile properties of as-forged, effect of structure on, 9: 2279(R)

creep-rupture strength of, 9: 633

creep-rupture tests at 1600°, 1800° and 2000°F, 9: 4798(R)

ductility, tensile properties, and effects of composition and stabilizing treatment on stability, 9: 5344(R)

forging and ductility of welded specimens, 9: 5953(R)

grain boundary diffusion in, as bonding agent between Ti and steel, 9: 4182

grain growth, effects of dispersed carbides, 9: 3486(R)

grain growth and size, microstructure, phase studies, and tensile properties of heat-treated, 9: 975

high-temperature tensile properties and microstructure, effects of heat treatment on, 9: 2719(R)

martensitic quench products and α' tempering, 9: 1843(R)

mechanical properties, effect of H on, 9: 1857

microstructure of heat-treated, 9: 2275(R)

phase studies and mechanical properties, 9: 1841(R)

plastic deformation and preferred orientation, 9: 1836(R)

precipitation hardening, heat treatment, and embrittlement of high-strength, 9: 4462

preparation, microstructure, phase studies, heat treatment effects, and mechanical properties, 9: 2729(R)

tempering of α' phase in, 9: 1844(R)

tensile properties at room temperature, effects of creep test conditions on, 9: 2275(R)

Titanium–molybdenum–vanadium alloys

hardness, influence of cooling rate on, 9: 1842(R)

phase studies, 9: 1844(R)

Titanium–molybdenum–vanadium alloys (cont'd)

phase studies and hardness of, cooled by oil, water, and air, 9: 1[illegible]

Titanium–nickel alloys

constitution diagrams and chemical analysis, 9: 6296(J)

grain boundary diffusion in, as bonding agent between Ti and steel, 9: 4182

powder preparation, microstructure, and x-ray-diffraction patterns, 9: 3841(R)

surface tension and wettability, 9: 4777(R), 7752(R)

thermal decomposition of transformed β-phase in, phase studies, and microstructure, 9: 7813(J)

Titanium–niobium alloys

resistivity-temperature-concentration relationships of, 9: 1538(J)

Titanium nitrides

reactions of, with Fe, Ni, Mo, Si, Nb, Ti, and Zr at 1600° to 1800°C, 9: 3821(J)

vaporization and heat of formation of, 9: 2153(J)

Titanium–nitrogen systems

constitution diagrams, 9: 2339(J)

fabrication, heat treatment, and effect of microstructure on mechanical properties of, 9: 178

mechanical properties of, effects of structure and composition on, 9: 201(J)

microstructure, impact testing, and effects of strain rate and temperature on tensile properties of annealed, 9: 2296

preparation, double inert-gas arc melting, forging, and welding, 9: 3489(R)

size of interstitial solute atoms, lattice expansion, and electronic properties of close packed, 9: 1780(J)

tensile properties in the temperature range -196 to 515°C, 9: 5667

Titanium oxide–aluminum oxide systems

thermal expansion, 9: 3844(R)

Titanium oxide–barium oxide systems

phase studies, crystal structure, heat treatment, and constitution diagrams, 9: 3142(J)

Titanium oxide–calcium oxide systems

fabrication, hydration, refractory properties and thermal expansion, 9: 945(R)

Titanium oxide–uranium oxide systems

phase studies, 9: 925

Titanium oxides

combined with oxides of Fe, Co, and Ni, preparation and fluorite structures, 9: 857(J)

dissociation and reduction by CO, 9: 4201

electrolytic reduction of, for production of Ti, 9: 4475(J)

fabrication and dielectric properties for linear accelerator wave guides, 9: 1096

heat and free energy of formation, 9: 529(J)

heat of adsorption measurements, 9: 4830

physical properties of TiO, Ti_2O_3, Ti_3O_5, and TiO_2, 9: 3498(R)

reduction by carbon, equilibrium in, 9: 5255(J)

thermal fracture under quasi-static thermal stresses, 9: 1506(J)

Titanium(IV) oxides

adsorption of A, He, and Ne on, 9: 4366

crystal structure, effect of method of preparation on, 9: 2619(J)

dense polycrystalline samples, preparation, 9: 4779(R)

dielectric properties and solid-state reactions of, with binary, ternary, and quarternary systems of CaO, MgO, and SnO_2, 9: 3820(J)

preparation from bauxite sludge, 9: 6300(J)

thermal conductivity, methods of measurement, 9: 7327(R)

Titanium oxyfluorides
structure, 9: 2190(J)
Titanium–oxygen–nickel systems
phase studies, 9: 1874(J)
Titanium–oxygen–phosphorus systems
metallic phases in, 9: 858(J)
Titanium–oxygen systems
chemical properties, hardness, phase studies, and preparation, 9: 6360
constitution diagrams, 9: 2339(J)
creep deformation of, 9: 175(R)
creep-rupture tests in He atmosphere, 9: 5341(R)
evaporation rate of, 9: 2209(J)
fabrication, heat treatment, and effect of microstructure on mechanical properties of, 9: 178
isotopic equilibration determination of O in, 9: 3394
preparation, double inert-gas arc melting, forging, and welding, 9: 3489(R)
preparation of homogeneous, 9: 4809
size of interstitial solute atoms, lattice expansion, and electronic properties of close-packed, 9: 1780(J)
vapor-solid equilibria in, 9: 2772(J)
Titanium powders
silicon coating, negative results, 9: 3496
preparation by crushing hydrided Ti sponge, 9: 7785
Titanium silicides
binding with Ni, properties, 9: 4791(R)
Titanium–silver alloys
constitution diagrams, discussion of, 9: 7362(J)
lattice parameter, resistivity, magnetic susceptibility, and other physical properties, 9: 5055
Titanium–stainless steel couples
electrochemical corrosion, 9: 1838(R)
Titanium sulfides
melting of TiS_2, negative results, 9: 4437(R)
x-ray studies of, 9: 887(J)
Titanium–tantalum alloys
hot-rolled textures of, 9: 1836(R)
phase studies and physical properties, 9: 1528
quench transformation in, 9: 1844(R)
Titanium–thorium alloys
surface hardening by nitridation, 9: 978(R)
Titanium–thorium oxide systems
hardness and microstructure, 9: 2246
Titanium–tin alloys
alpha + β phase in, determination of, 9: 7378(J)
densities, melting points, and thermal and x-ray diffraction analyses of various phases in heat-treated, 9: 2281(R)
hydrogen equilibrium pressure and temperature in single phase, 9: 2329(J)
volumetric determination of Sn in, 9: 89(J)
Titanium–tungsten alloys
phase studies and physical properties, 9: 1528
Titanium–uranium alloys
metallographic, x-ray, and dilatometric study of, 9: 7013(J)
phase studies by thermal, microscopic, and x-ray analysis from 0 to 30 at.% Ti, 9: 1543(J)
Titanium–vanadium alloys
mechanical properties and phase studies, 9: 5666
Titanium–vanadium alloys (cont'd)
mechanical properties and welding, 9: 4789(R)
notch sensitivity, 9: 1549(J)
phase studies, plastic deformation, and crystal structure, 9: 4463
preparation by nonconsumable and consumable electrode arc melting, 9: 2293(R)
retention of soft β in ice-brine quenching of, containing $\geq$ 15%, 9: 1841(R)
room-temperature dynamic elastic modulus and its ratio to density, 9: 2728(R)
structure of ω-phase, 9: 4815(J)
x-ray diffraction analysis, hardness, thermal expansion, electric conductivity, phase studies and heat treatment, 9: 2763(J)
Titanium–zinc alloys
heat capacities and entropies at 298.16°K, 9: 4374(J)
heat content of, up to 1798°K, 9: 4375(J)
Titanium–zirconium alloys
fabrication, 9: 1530(R)
hot-rolled textures of, 9: 1836(R)
Titanium–zirconium couples
diffusion of Zr in, tracer study, 9: 630
Titanium–zirconium oxide systems
hardness and microstructure, 9: 2246
powder metallurgy, 9: 3496
Titration equipment
(See also Laboratory equipment; Remote-control equipment.)
automatic coulometric, design, 9: 2160
automatic thermometric, 9: 2331(R)
design of trigger circuit for automatic coulometric, 9: 101(J)
large volume cell for simultaneous titrations and conductometric analyses, design, 9: 4094
photometric, for spectrophotometer, 9: 4081(J)
Toadelena Quadrangle (N. Mex.)
preliminary geologic map of, 9: 5329(J)
Tobin Creek Area (Alaska)
monazite occurrence in, 9: 1523(J)
Todilto Formation (Ariz.)
geology, 9: 1828
Tofty Tin Belt District (Alaska)
mineralogy of, 9: 1523(J)
Tolan crystals
(See Acetylene, diphenyl-crystals.)
Toluene
pyrolysis, analysis and graphitization of carbons from, 9: 5905(R)
radioinduced chlorination of, 9: 1550(R)
Toluene, p-cyano-α-iodo-
exchange reaction with KI, 9: 6179
Toluene, α-iodo-p-iodo-
exchange reaction with potassium iodide, tracer study, 9: 4414
Toluene–1-propanol–water systems
solubility diagrams and physical properties, 9: 7272(R)
Toluene, trinitro-
detonation velocities of, 9: 3214
Toluenesulfonic acid, triphenylethyl esters
mechanism of Wagner-Meerwein rearrangement in, 9: 1755(J)
Tongue River Member (S. Dak.)
geology and ore distribution, 9: 7758

Too High No. 1 Open Pit (Colo.)
geology, 9: 1513
Tori
remanent magnetism in, 9: 7166
Totem Operation
fission products from, uptake by plants and animals, 9: 35(J)
Tower Shielding Facility
control rod calibration, 9: 750
Toxins
from Cl. botulinum and staphylococci, inactivation by γ radiation, 9: 474
Tracer techniques
(See also appropriate subheadings under the device, material or phenomena studied by tracer methods; see also Radioisotopes; Stable isotopes.)
applications in chemical, biological, medical, and geological research, 9: 7691(J)
applications to engineering and basic sciences, 9: 7898(J)
clinical studies, tritium and C^{14} in, 9: 3748(R)
distribution studies between melts, tracer studies, and solid phases using, 9: 6554(R)
an eight-year summary of the utilization of stable and radioactive isotopes, 9: 7062(J)
industrial applications of radioisotopes, conference, 9: 3807(J)
review, 9: 5305(J)
Tracer techniques (agriculture)
applied to metabolic studies, 9: 7666(J)
applied to the distribution of nutrients in soils, 9: 7667(J)
procedures and difficulties of, review, 9: 5862(J)
Tracer techniques (biology)
applications, review of, 9: 7655(J)
applied to metabolic studies, 9: 7666(J)
excretion of PO_4, Ca, and glucose studied by, 9: 6593(J)
fundamentals and techniques, book, 9: 4686(J)
in hematological studies, 9: 5587
in vivo determination of two isotopes simultaneously, 9: 3730(R)
measurement of radioactivity in organisms, in vivo, 9: 5121(J)
measurements of total exchangeable Na and K using Na^{22} and K^{42}, 9: 4696(J)
preparation of labeled compounds and results, conference, 9: 3719(J)
procedures and difficulties of, review, 9: 5862(J)
radiopotassium dilution method for the measurement of cardiac output, 9: 4364(J)
theoretical and practical manual for biological students and research workers, 9: 510(J)
thyroid-uptake studies using I^{131}, improvements for, 9: 1737(J)
Tracer techniques (chemical engineering)
application of A^{37} to determine argon behavior in vacuum systems, 9: 4436(J)
application of europium isotopes to study flow through agitators of U pilot leach plant, 9: 2261
applied to measurements of fluid velocity distributions, 9: 4988
Tracer techniques (chemistry)
application to study of Dieckmann condensation of diethyl pherylenediacetate, 9: 6632(J)
applied to study of interaction of hair fibers with aqueous solutions including dye baths, 9: 922
correction factors for comparing activities of C^{14}-labeled compounds assayed in a flow proportional counter, 9: 4853(J)
isotopic exchange in the Mn^{++} and MnO_4^- reactions, 9: 6631(J)
laboratory techniques, manual, 9: 7980(J)
Tracer techniques (chemistry) (cont'd)
preparation of labeled compounds and results in biochemical studies, conference, 9: 3719(J)
review, 9: 3582(J)
synthesis of C-labeled isotopes, bibliography, 9: 1488
Tracer techniques (engineering)
lubricant wear measurement by, 9: 7742(J)
study of steam contamination and steam-water mixtures by, 9: 7743(J)
Tracer techniques (geology)
differentiation of oil-and water-bearing beds by radioactive methods, 9: 7779(J)
geologic dating by A^{40}/K^{40} ratio, 9: 3463(J)
geophysical prospecting using radioisotopes, 9: 7778(J)
influence of bound β decay on geologic age determinations, 9: 953(J)
petroleum exploration using radioactive Na, 9: 7780(J)
petroleum prospecting and field development using radioisotopes, 9: 7781(J)
prospecting methods using, 9: 7777(J)
Tracer techniques (metallurgy)
application of, to mass transfer in liquid baths, 9: 7799(J)
application of, to refractory material effects on contamination of steel, 9: 7753(J)
branding of steel with radioisotopes, 9: 7806(J)
cutting tool wear measurement using, 9: 7803(J)
diffusion and evaporation measurement in metals by, 9: 7801(J)
diffusion and self-diffusion in metals and fabrication and decomposition of steel, 9: 7807(J)
diffusion measurements, effects of method of counting radiation on reproducibility of, 9: 197(J)
diffusion measurements in metals by, 9: 7802(J)
diffusion of Po into Ni and Pb measured by, 9: 6257(J)
estimation of machine wear by, 9: 7750(J)
fabrication and analysis of alloys, 9: 7819(J)
method for following surface diffusion of radioisotopes, 9: 4531(J)
purification of pig iron by removal of S into $CaO-Al_2O_3$, 9: 7683(J)
radiographic study of non-metallic inclusions by, 9: 7800(J)
thickness and density measurements with, 9: 7805(J)
Tracer techniques (mineralogy)
dispersion of saline solutions in soils, studied by P^{32}, 9: 6644(J)
Tracerlab, Inc., Boston
progress reports on chemical systems sensitive to radiation, 9: 2847(R), 2848(R)
progress reports on development of slow neutron survey equipment, 9: 3930(R), 3931(R)
progress reports on utilization of radioactive energy as a source of battery power, 9: 267(R), 268(R)
Trader Smith's Claims (Utah)
mineralogy, 9: 1829
Tradescantia
chromosome breakage in, with Ca deficiencies, 9: 3006(J)
effects of mixed radiation from nuclear explosions on, 9: 823(J)
microspores, radioinduced chromosome aberrations in, effect of linear energy transfer on, 9: 835(J)
radioinduced chromosome breakage in, 9: 4356(J)
radioinduced chromosome breakage in, effect of 0 tension on, 9: 5859(J)
Tradewater Formation (Ill.)
geology and radioactivity of coal and shale deposits in, 9: 6853
Transformation temperatures
(See also Phase studies.)

Transformation temperatures (cont'd)
measurement of solution critical points, 9: 513
Transformers
(See also Pulse transformers.)
heating, for use with Mg–Th alloy at 1000°C, design, 9: 931
impulse, design and performance of, for condenser impulse welding, 9: 641
life of, in radiation detection instruments, 9: 1329(J)
Transistors
characteristics of, and circuits employing, 9: 7449
magnetic amplifier used for reactor control, 9: 7931(J)
magnetic field, stabilization with, 9: 6376
in neutron flux measurement systems, 9: 7454(J)
theory and use in miniature delay lines, 9: 5095
voltage output, effects of radiation on, 9: 3208(R)
voltage regulation with, 9: 7070(R)
Transonic flow
(See also Subsonic flow; Supersonic flow.)
streamlines in, theory, 9: 1243(J)
Transplutonic elements
(See also specific elements.)
separation from Pu, design of equipment for, 9: 571(J)
separation of, from irradiated Pu, 9: 3098
Transuranic elements
(See also specific elements.)
chemical and physical properties, 9: 2683(J)
crystal chemistry of compounds of, 9: 2372(J)
position of, in periodic table, 9: 4947(J)
preparation and chemistry of, 9: 7103(J)
separation and purification from rare earths by ion exchange, 9: 7985(P)
Traps
(See also Filters; Vacuum systems.)
diffusional and circulating cold, testing, 9: 4179(R)
diffusion pump cold, design of a refrigeration system to control temperatures, 9: 5931
for radioactive and other boiling liquids, design, 9: 1779
Trauma
(See also Wounds.)
of skin, formation of new capillaries following, effects of x irradiation on, in mice, 9: 2561(J)
surgical, effects on survival following low-rate x irradiation in chicks, 9: 2547(R)
1,3,4-Triazole, 3-hydrazino-5-thiol-
crystal structure, 9: 7272(R)
Tributyl phosphate
(See Butyl phosphates.)
Trichinosis
amino acid metabolism in host and parasite, tracer study, 9: 5206(R)
effects of γ radiation on, 9: 493(J)
incorporation of amino acids by Trichinella larvae, 9: 2099(R)
Trifluoromethyl groups
heat of formation, 9: 1772(J)
Trillium
microsporogenesis in excised anthers of, grown on steril media, 9: 3718(J)
Trimethylamine
direct fluorination, 9: 890
infrared spectra of boron compound addition compounds with, 9: 6874
Trimethylamine (cont'd)
purification and separation from NH_3 and primary and secondary amines, 9: 7263
2,4,6-Trinitrophenol
(See Picric acid.)
Triose phosphates
chromatographic determination of glyceraldehyde-3-phosphate and dihydroxyacetone phosphate in a mixture, 9: 1764
Triphenylmethyl groups
reaction mechanisms with benzoyl peroxide, 9: 2331(R)
Tritium
assay in water samples, 9: 5628(J)
binding energy, 9: 4273(J)
concentration in tritium–hydrogen mixtures, thermal diffusion column for, 9: 6392(J)
continuous monitoring in air, design of ionization chamber, 9: 7450
cosmic-ray produced, abundance and distribution in natural waters, 9: 1696
detection and concentration measurements in Geiger tubes, 9: 2864(J)
determination of, by isotopic gas analysis, 9: 2180(J)
deuteron breakup on, 9: 7159(J)
deuteron reactions (d,n), use in comparing some methods for the absolute measurement of a fast neutron flux, 9: 3985(J)
deuteron reactions (d,n) at 64 to 954 kev, analysis of data from, 9: 7547(J)
elastic scattering of protons by, 9: 7512(J)
mass ratio of D and, 9: 2097(J)
moisture penetration in coatings, determination by, 9: 2784(J)
nuclear configuration and nuclear magnetic moment of, calculated from j-j coupling, 9: 355(J)
production by deuteron bombardment, 9: 2920(J)
production by 2.2-Bev protons on Fe and its relation to cosmic radiation, 9: 3651(J)
production by 2.2-Bev protons on N and O, 9: 2922(J)
production in high-energy d-d collisions, comparison to He^3 production, 9: 1659(J)
proton reactions, energy levels of α particles from, 9: 741(J)
proton reactions (p,γ) over range 0.1 to 0.2 Mev, 9: 7548(J)
proton reactions (p,n), 1 to 7 Mev, 9: 6770(J)
radiometric determination of, in body fluids and aqueous solutions, 9: 5111
radiometric determination of, in hydrogen, 9: 4511
radiometric determination of, in water, 9: 4852(J)
radiometric determination of, performance of a liquid scintillation counter, 9: 2136(R)
reactions with Co, effect of β radiation on, 9: 6940(J)
tissue distribution and toxicology of, in rats and man, 9: 12
as a trace element in clinical studies, 9: 3748(R)
Tritium compounds
formation of tritium-labeled organic compounds by heterogeneous recoil tagging, 9: 4759(J)
preparation, 9: 2180(J)
Tritium halides
one-to-two millimeter wave spectra of TCl and TBr, 9: 4033(J)
Tritium hydrides
(See Hydrogen tritides.)
Tritium–hydrogen systems
preparation of standard samples for mass spectrographic analysis, 9: 3248
Tritium oxides
(See Water-t; Water-t_2.)

Tritons

angular distribution in (t,2p) reactions, 9: 3323(J)

binding energy, equivalent two-body method for, 9: 4336(J)

mesonic decay of excited, 9: 4220(J)

range-energy and energy-momentum relations, tables, 9: 402

range-energy relations in nuclear emulsions up to 10 Mev, 9: 4250(J)

ranges in materials, prediction, 9: 2928

Tropolones

molecular rearrangements, 9: 6890(J)

Truckee Canyon Group (Nev.)

geology and U occurrence, 9: 6963

Trypsin

effects of treatment with, on radiation-recovery factor in tissue homogenates of spleen and bone marrow, 9: 3370

Tryptophan

effects of dietary, on gene action in Drosophila, 9: 3371(J)

Tuba City Area (Ariz.)

mineralogy, 9: 1829

Tubes

(See also Pipes.)

fluid velocity distributions, 9: 5315(J)

heat flux during boiling of water in vertical, 9: 4434(J)

heat transfer and effect of voids and Prandtl modulus in tube banks and beds, 9: 2692

metal, thermal gradient and internal pressure stresses in, 9: 3124(J)

for transferring liquid hydrogen, design, 9: 3089

vertical, closed at bottom, heat-transfer coefficients and temperature distribution in, measurement, 9: 1805

welding procedures for, in heat exchangers, 9: 216(J)

Tubutulik River Area (Alaska)

mineralogy and U distribution in, 9: 1523(J)

Tufts College

progress reports on preparation of metal hydrides, 9: 635(R)

Tumors

(See also Bone tumors; Brain tumors; Carcinomas.)

ascites, effects on vascular permeability, 9: 2547(R)

ascites associated with endothelioma, therapy with colloidal Au^{198}, 9: 4682(J)

of bladder, radiotherapy by means of balloons filled with Co^{60} solutions, 9: 7651(J)

cell nuclei, effects of β radiation, 9: 2547(R)

concentration of P^{32} in skin, 9: 6834(J)

diagnosis, ultrasonic equipment for, 9: 2541(J)

effects of total-body irradiation on nucleic acid, nitrogen, and water content of Yoshida sarcoma, 9: 7246(J)

of eye, diagnosis of, by differential uptake of P^{32}, and radiosensitivity of mouse ascites, 9: 18

of eye, differential uptake of P^{32} in diagnosis, 9: 49(J)

growth, effects of continuous irradiation on, 9: 3(R)

growth of, effects on incorporation of adenine into nucleic acids in mice, 9: 1449(J)

growth of cell populations of, calculations of, by Monte Carlo method, 9: 6822(J)

induction and therapy of, conference, 9: 7226(J)

intracranial, therapy with injected radioactive gold colloids, 9: 1172(J)

lymph node metastases of breast, uptake of Au^{198} colloids by, 9: 7652(J)

malignant, radioresistance, 9: 3017(J)

malignant, serous effusions arising from, therapy with colloidal Au^{198}, 9: 3041(J)

malignant, of skin following radiation therapy, 9: 32(J)

Tumors (cont'd)

malignant, therapeutic and tracer applications of radioisotopes, 9: 4926(J), 4927(J)

malignant, of the bladder, radiotherapy with Co^{60}, 9: 6851(J)

malignant, of thyroid gland, uptake of I^{131} by, 9: 500(J)

malignant epibulbar melanoma, radiotherapy, 9: 5244(J)

metabolism of purine in, tracer study, 9: 6594(J)

origin of, theory, 9: 6575(J)

phosphorus metabolism in Ehrlich ascites, effects of irradiation and fasting on, tracer study, 9: 7232(R)

pituitary, spontaneous and radioinduced in mice, 9: 2559(J)

of pituitary gland, factors affecting, 9: 6835(J)

radiation implant therapy, and localization of antitumor antibodies labeled with I^{131}, 9: 3748(R)

radiation treatment of hemangioma of extremities of infants, retardation of skeleton by, 9: 7630(J)

radioinduced, in Drosophila, 9: 3022(J)

radioinduced, effects of bone marrow injections on development of, in mice, 9: 2597(J)

radioinduced, in mice, 9: 2563(J)

radioinduced, in rats, 9: 17

radioinduced, relationship of latent erythrocyte changes to, in rats, 9: 6579(J)

radioinduced hemangioendotheliomas in mice, 9: 827(J)

radiosensitivity of, effects of vitamin C-free diet on, in laboratory animals and man, 9: 3043(J)

radiosensitivity of, factors affecting, 9: 6589(J)

radiotherapy of, review, 9: 3044(J)

radiotherapy of, research studies, 9: 7253(R)

radiotherapy of, use of implants of Ta^{182}, 9: 5242(J)

radiotherapy of effusions associated with metastatic, using Au^{198} colloids, 9: 7649(J)

radiotherapy of effusions associated with metastatic, using radioactive chromic phosphate, 9: 7650(J)

of skin, effects of inhalation of oxygen on x radiation therapy, 9: 2134(J)

of skin, induced by radioactive and chemical carcinogens in mice, 9: 2565(J)

spontaneous, in small laboratory animals, in literature survey, 9: 2549(J)

of thyroid, and metastasis from, localization by uptake of I^{131}, counting method, 9: 46(J)

tissue cultures of cells of Ehrlich, physiology, 9: 5570

transplantation of, into lung, 9: 2099(R)

transplanted, effects of pre-treatment with P^{32} or Au^{198} on growth in rats, 9: 6578(J)

treatment of, by irradiation of pituitary gland, 9: 7642

uptake of I^{131} by malignant melanomas, effects of thyroidectomy, 9: 3028(J)

of urinary bladder, radiotherapy, intracavitary administration of Co^{60} for, 9: 6169(J)

of urinary bladder, radiotherapy with Y^{90}, 9: 5243(J)

Tungsten

adsorption of, from HCl and HCl–HF solutions, 9: 6234(J)

adsorption of O_2, H_2, and CO on evaporated films of, 9: 2159(J)

corrosion by Bi–Pb–Sn alloy at elevated temperatures, 9: 6659

corrosion by nitric oxide at high temperature, 9: 6308(J)

differential neutron elastic scattering cross sections at 4.1 Mev, 9: 4597(J)

electric conductivity, 9: 976

electric conductivity of wires of, effects of radiation on, 9: 800(R)

electron bremsstrahlung spectrum near 1 Mev, 9: 1307(J)

electron scattering by, at 31, 40, and 60 Mev, 9: 7562(J)

Tungsten (cont'd)
excitation functions, 9: 7128(J)
extension of Matthiessen's Rule to cold-worked, 9: 1536(J)
filament activation by Gd, 9: 2794
fission by π^- mesons, and star formation, 9: 6436(J)
fission by slow π^- mesons, 9: 6738(J)
fission with 280-Mev deuterons, yields and neutron emission, 9: 7037(J)
gamma ray yields from Coulomb excitation, 9: 6052(J)
film-surface area of evaporated, measurement, 9: 3887(J)
gamma penetration, tables and graphs, 9: 2472
meson (π^-) capture by, fission and star formation yield, 9: 7473(J)
neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 3443(J)
oxidation of, under conditions of linear temperature increase, 9: 182
physical properties for furnace design, review, 9: 1213
polishing and etching of metallographic specimens of, method for, 9: 1865(J)
positive ion yields from, by, electrostatic fields, 9: 988(R)
properties and reactor applications, 9: 6476
proton- and π^--meson-induced fission in, study of mechanism and results, 9: 7935(J)
proton irradiation effects on electrode potential, 9: 7954(J)
proton reactions at 460 Mev, fission and star formation, 9: 7538(J)
radiochemical determination, 9: 876
secondary electrons from, for primary electrons of 20 kev to 1.3 Mev, 9: 5989(J)
separation of, by anion exchange, 9: 912(J)
specific heat of, 9: 237(J)
spectrographic determination in Ti and Ti alloys, 9: 639(R)
spectrographic determination of, in ores and rocks, 9: 182
surface reactions, determined by field-emission microscopy, 9: 2741
toxicity of, in lungs of guinea pigs, 9: 6854(J), 6858(J)
transition probabilities, dipole and quadrupole, 9: 7917(J)
wetting with sodium silicate glass, 9: 6646(R)

Tungsten–aluminum alloys
crystal structure, 9: 2373(J)

Tungsten borides
preparation by vacuum technique, 9: 1821(J)
reactions with C and N_2, equilibria studies, 9: 5677(J)

Tungsten carbide–cobalt systems
resistance sintering under pressure, 9: 1878(J)
strength, composition, and grain size of sintered, 9: 2755(J)

Tungsten carbides
properties of, effect of molten Ti on, 9: 2247
toxicity of, in lungs of guinea pigs, 9: 6854(J), 6859(J)
toxicity of, with cobalt, in lungs of guinea pigs, 9: 6860(J)

Tungsten–carbon–molybdenum systems
phase studies and preparation, 9: 5359

Tungsten–carbon–silicon systems
phase diagrams, 9: 4704

Tungsten–chromium alloys
fabrication, 9: 2326(J)

Tungsten–chromium–cobalt–nickel alloys
mechanical properties, effects of rare earth additions on, 9: 4457
preparation, fabrication, density, tensile properties, microstructure, hardness and temperature effects of aged and sintered X-40 compacts, 9: 3173
weldability of wrought, 9: 3530(J)

Tungsten–chromium–molybdenum–nickel alloys
compressive-stress-rupture properties of high temperature, 9: 3503(R)

Tungsten–cobalt–molybdenum–nickel alloys
compression-creep properties, 9: 3504(R)

Tungsten isotopes W^{180}
gamma spectra and half lives of isomers, 9: 736

Tungsten isotopes W^{181}
electron capture, total decay energy in, 9: 4628(J)

Tungsten isotopes W^{182}
decay schemes, 9: 3338(J)

Tungsten isotopes W^{183}
decay schemes, 9: 3338(J)
energy levels and γ spectra, 9: 4333
nuclear magnetic moments, 9: 5484(J)
radiation characteristics of, 9: 5816(J)

Tungsten isotopes W^{184}
fission cross sections for 380-Mev neutrons, 9: 5156(J), 5778(J)

Tungsten isotopes W^{185}
decay scheme, 9: 2965(J)
disintegration of, electromagnetic radiation from, 9: 1122(J)
radiation characteristics of, 9: 5816(J)

Tungsten–molybdenum–thorium alloys
forging in inert gas, 9: 984(J)

Tungsten oxides
heat and free energy of formation, 9: 529(J)

Tungsten oxyfluorides
preparation, 9: 1426(P)

Tungsten silicides
reactions with C and N_2 at 2000°K, 9: 4704

Tungsten–titanium alloys
phase studies and physical properties, 9: 1528

Tungsten–uranium alloys
phase studies, 9: 4471(J)

Turbidimeters
(See Nephelometers.)

Turbine blades
casting and forging high-temperature alloys for, 9: 3869
creep, rupture, and thermal shock tests on heat-resisting alloys low in Co and Nb for castable, 9: 1890(J)
design and fabrication of B_2 turbosupercharger buckets, 9: 3173
forging of powder metallurgy Al alloys for, and mechanical properties, 9: 7358
heat treatment, 9: 7348
thermal-shock resistant properties of, fabricated from $MoSi_2$, 9: 1249

Turbines
closed cycle gas, cycle study for Submarine Advanced Reactor, 9: 3288
contamination of, in boiling water reactors, 9: 6480(J)
design and operation of air-lubricated, 9: 7844

Tyrosine, iodo-
determination and separation by an ion exchange method, 9: 6900

U

Ultrasonic inspection
(See Sonic inspection.)

Ultrasonics
application of, to cancer diagnosis, 9: 2541(J)
bibliography of nondestructive testing by, 9: 2237
in cleaning hot metallographic samples, 9: 567(J)

Ultrasonics (cont'd)
diagnostic uses, 9: 6584(R)
effects on electrodeposition of Ni, 9: 5053
effects on molten metals, 9: 5065
isotopic separation by, 9: 5415(J)
welding of 2S aluminum, 9: 5352
Ultraviolet radiation
from alpha bombarded gases, 9: 5405(J)
biological effects, book, 9: 4046(J)
biological effects of, effects of dose fractionation on, in yeast, 9: 6565
chromosome aberrations induced by exposure to, in maize, 9: 7236(J)
cytological effects of, on E. coli, 9: 2107, 2108
detection by photosensitive Geiger counters, 9: 5441(J)
effects on blood picture, 9: 5221(J)
effects on luminescence from Tl-activated and unactivated NaI and CaF crystals, 9: 5109
effects on solutions of protein, cystine, and thymonucleic acid, 9: 5291(J)
effects on chromosomes in tomato plants, 9: 1451(J)
specific activity determinations, 9: 3262(J)
transmission characteristics of solids and gases, 9: 5441(J)
Union of South Africa (Cape Province)
gadolinium minerals distribution in, 9: 7335
United States
fall-out monitoring in, following Operation Teapot, 9: 7636
mineral investigations resource appraisals map of U deposits in, 9: 6968
prospecting for U in, 9: 5651(J)
United States Testing Co., Inc. Boston Research Div., Boston.
progress reports on plastic compounds, 9: 6639(R), 6640(R)
Uracil, 2-thio-
pathological effects of, in rats, 9: 4039(R)
physiological effects of, on thyroid gland, in rats, 9: 5571
Uraninites
(See also Pitchblendes.)
age determinations on, by x-ray techniques, factors affecting, 9: 3839(J)
age estimation by crystal lattice shrinkage, 9: 6966(J)
age estimation of, from Rhodesia, Manitoba, Madagascar, and Transvaal, 9: 6278(J)
ages of, methods for calculating, 9: 1233(J)
classification and properties, 9: 1233(J)
occurrence in Ontario and Quebec, composition, lattice constant, and diffraction intensities, 9: 6655(J)
unit cell dimensions, 9: 7762(J)
Uranium
activation determination of microgram and submicrogram quantities of, 9: 4730(J)
adsorption of, from HCl and HCl–HF solutions, 9: 6234(J)
adsorption on anion exchange resins, factors influencing, 9: 6865
analysis by fluorescence photometer, 9: 5100(J)
analysis of, for N_2 and O_2, 9: 7288
anodic oxidation, 9: 130(J)
attenuation of 190-Mev deuterons and 340-Mev protons, 9: 778
bremsstrahlung in, electron cross sections for, 9: 6046(J)
burnup in reactors, determination of, using a scintillation spectrometer, 9: 3264(J)
cathodic vacuum etching of, 9: 128
chemical analysis, review, 9: 4200(J)
Uranium (cont'd)
chromatographic determination of, in soil samples, 9: 3404(J)
colorimetric analysis for micro-amounts of B, 9: 2163
colorimetric analysis for Si, following solvent extraction, 9: 7297
colorimetric analysis of, for P, 9: 7696
colorimetric determination of, in ores, 9: 7294
colorimetric determination of, in U concentrates, 9: 5266(J)
colorimetric determination of, with NH_4SCN, 9: 1151(J)
combination with He by chemical cathodic activation and thermal decomposition of He–U complex, 9: 6887(J)
concentration in stone meteorites by Pb^{207}/Pb^{206} method, 9: 4445(J)
concentration of β activity in, after heat treatment, 9: 6145(J)
cosmic abundance of, in chondritic meteorites, 9: 3065(J)
crystal structure of β, 9: 1209(J)
deformation on continuous heating up to 700°C, 9: 5202(J)
detection by fluorophotometer, 9: 5433(J)
detection of, in Al by colorimetric spot tests, 9: 1196
determination and separation from Th by 2, 4-dichlorophenoxyacetic acid, 9: 3782(J)
determination by an isotopic dilution method, 9: 6194
determination in low-grade acid solutions, 9: 7293
determination in presence of large amounts of Hg, 9: 4724
determination of, by precipitation as ammonium diuranate and subsequent ignition, 9: 4384
determination of, in ancient marine sediments, 9: 7764(J)
determination of microgram amounts of, in iron by x-ray fluorescence analysis, 9: 4382
determination of trace impurities in, by ion exchange techniques, 9: 884(J), 1793(J)
deuteron reactions (d,p) at 15 Mev, proton energy spectra from, 9: 4574(J)
dimensional stability, effects of radiation on, 9: 7220
elastic scattering of electrons by, differential cross sections, 9: 4613(J)
elastic scattering of polarized protons from, 9: 4893(J)
electric conductivity, effects of small strains on, 9: 2098
electrolytic polishing, apparatus for, 9: 2328(J)
electrolytic refining, 9: 6237
electron micrographs of cathodic vacuum etched, 9: 128
exploration for, book, 9: 960(J)
extraction by TBP and TBP–Amsco, mechanism of, 9: 585
extraction of, from ore concentrates, 9: 3155(J)
extraction of, from U ores using carbonate solution, 9: 911(J)
extraction with ethyl acetate from U concentrates, 9: 5266(J)
films, preparation of thin, 9: 3945(J)
fission, search for Sr isotopes from, 9: 4559(J)
fission by fast protons, effect of 0- to 450-Mev excitation energy, 9: 7540(J)
fission by 14, 180, and 460 Mev neutrons, 9: 6771(J)
fission by slow π^- mesons, 9: 6738(J), 6739(J), 6771(J)
fission by π^- mesons, and star formation, 9: 6436(J)
fission by 30, 80, and 250 Mev γ rays, 9: 6771(J)
fission fragment angular distribution for 60-, 150-, and 320-Mev excitation energies, 9: 7539(J)
fission yields of Sm^{153}, Eu^{156}, Gd^{159}, and Tb^{161} from, 9: 1700(J)
fluorimetric and colorimetric microdetermination in rocks and minerals, 9: 134(J)
fluorimetric determination, in ore samples, 9: 7695
fluorimetric determination of, in H_2SO_4, 9: 1761

Uranium (cont'd)
gamma penetration, tables and graphs, 9: 2472
gamma scattering cross section in, 9: 6043(J)
gamma scattering by nuclear electric field, 9: 4610(J)
geochemistry and recovery from ores, 9: 4995
geochemistry of, special problems of, 9: 6962
gravimetric, titrimetric, spectrophotometric, and fluorophotometric determinations, ANL procedures for, 9: 4074
gravimetric determination of, as oxinate using complexone as masking agent, 9: 4113(J)
handbook on inorganic chemistry of, translated from Gmelin, 9: 926(J)
heat-transfer resistance between, and Al, 9: 4435(J)
ingots, casting, using consumable electrode arc melting, 9: 7382(J)
inhibition of salivary amylase by, 9: 5585(J)
low-pressure H_2 solubility in, 9: 1797(J)
mass spectrographic determination, 9: 6896
meson (π^-) capture by, fission and star formation yield, 9: 7473(J)
μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)
metallurgy of, in nuclear energy, 9: 7376(J)
mining and production of, in South Africa, 9: 4786(J)
mines, ventilation of, 9: 496(J)
mining of, in South Africa, 9: 163(J)
natural fission rate of, radiochemical measurement, 9: 1148(J)
neutron absorption and total cross sections at 1.4 Bev, 9: 5486(J)
neutron absorption in bulk, 9: 3712(J)
neutron capture cross section, relative accuracy of Swing measurement, 9: 2473
neutron cross sections and reactor constants, 9: 5762
neutron inelastic scattering, group theory, 9: 3963
neutron production in, from electron bombardment, 9: 3964
neutron yield from photodisintegration, 9: 7933(J)
occurrence in coalified wood from upper Devonian blackshale in Tenn. and Ohio, 9: 6277(J)
orientation textures of annealed sheets and phase studies of, 9: 6993
paper chromatography, 9: 4946(J)
polarographic determination, 9: 3402(J), 5887(J)
polarographic determination of, in presence of Fe and Cu, supporting electrolytes for, 9: 1149(J)
polarographic determination in ores and process samples, effects of impurities and additives on, 9: 133(J)
polarographic determination in ores in ascorbic acid supporting electrolyte, 9: 1232(J)
polarographic determination of, in presence of other ions, 9: 1150(J)
potentiometric determination of, in uranyl chloride solutions, 9: 2686(J)
potentiometric determination of small amounts of, in Zr, 9: 4725
precipitation from leach solutions, 9: 7275
precipitation of, from carbonate leach solutions using sodium amalgam, 9: 7726
precipitation of, from ore solutions by ammonium carbonate pressure leaching, 9: 4145(R)
preferred orientation in rolled sheets of, 9: 3000(J)
production, chemical process for, 9: 7602(J)
properties and reactor applications, 9: 6476
prospecting, a guide book for, 9: 6657(J)
prospecting for, in U. S., 9: 5326(R)
proton- and π^--meson-induced fission in, study of mechanism and results, 9: 7935(J)
proton fission at 480 Mev, cross sections and distribution curve, 9: 7936(J)
Uranium (cont'd)
proton fission of natural, yield and symmetry studies of, 9: 6144(J)
proton reactions (p,n), angular distributions and yields at 23 Mev, 9: 4290(J)
pseudo-binary phase sections between Laves phases in, 9: 3353(J)
purification by a melting process, 9: 6633
radiation damage and He impregnation of α-irradiated, 9: 7389(R)
radiometric determination, 9: 2634
radiometric determination in urine, 9: 7291
radiometric determination of, in presence of Pu, 9: 1598
radiometric determination of, in radioactive ores, 9: 878
reaction of N with, 9: 5309(J)
reaction with H, 9: 3118
recovery by ion exchange, 9: 6619, 6865
recovery from monazite sands, 9: 592(J)
recovery from pitchblende digestion residues, 9: 601(J)
recovery from roasted and carbonate-leached U-V ore, process, 9: 5549(P)
recovery from waste solutions, 9: 6634
refining methods and production of reactor fuel rods from, 9: 3711(J)
resonance absorption in spheres, 9: 3713(J)
retention of, during oxidative ashing of carbonaceous shales, 9: 881
separation from fission products by fluoride volatility process, pilot plant, 9: 6227
separation plants and procedures, 9: 590(J)
separation process and facilities at Harwell, 9: 591(J)
as shielding for burned-out reactor fuel elements, calculations, 9: 2984
solvent extraction from uranium leach solutions, 9: 6942
solvent extraction of, from a uranyl nitrate solution in nitric acid with TBP, performance of a louvre-plate redistributor for large-diameter pulse columns in, 9: 588(J)
solvent extraction of, from ammonium carbonate leach solution, 9: 5297(R)
solvent extraction of, with TBP and pentaether from production samples, 9: 7310
spallation-fission by high-energy protons, 9: 4343(J)
spectrophotometric determination based on absorbing complex of U(IV) with TBP, 9: 6897
spectrophotometric determination of, in sulfate solutions containing U, V, Cr, and rare earths, 9: 5263(J)
spectrophotometric determination of hexone in aqueous solutions of, 9: 533
spectrophotometric determination of microgram amounts in solutions, 9: 2633
superconductivity at very low temperatures, 9: 4033(J)
temperature distribution and thermal stresses due to thermal neutrons in cylindrical rod of, 9: 5201(J)
thermal conductivity, 9: 1994(R)
thermal conductivity and resistivity, 9: 4034(J)
thermal conductivity and thermal expansion, 9: 1266
thermal conductivity at 70°C, 9: 1879(J)
thermal expansion and annealing of rolled, 9: 5966(J)
thermionic properties, 9: 6868
three-quantum annihilation of positrons in, 9: 249(J)
vapor pressure, 9: 6868
volumetric determination in presence of Fe in poor ores, 9: 2228(J)
volumetric determination of, in complex minerals, 9: 542(J)
volumetric determination of hexavalent, 9: 4146
x-ray diffraction analysis of texture of rolled, 9: 5675(J)
Uranium (Al clad)
detection of corrosion pits and metallic inclusions by colorimetric spot tests, 9: 1196

Uranium acid phosphates

preparation, x-ray diffraction analysis, and solubility in H_3PO_4 solutions at 25°C, 9: 129

Uranium alloys

constitution diagrams, compilation of, 9: 5349

constitution of, discussions on, 9: 7014(J)

gravimetric analysis for Nb or Ta, 9: 5274(J)

properties and reactor applications, 9: 6476

spectrophotometric determination of Nb in, 9: 4074

Uranium–bismuth alloys (liquid)

corrosive effects on stainless steel, 9: 3285

Uranium carbide–beryllium carbide systems

constitutional diagram, preparation and properties, 9: 4416(J)

Uranium–carbon sandstone deposits (Ind.)

occurrence in coal fields, 9: 1515

Uranium–carbon sandstone deposits (S. Dak.)

occurrence in Harding Co., 9: 7758

Uranium–carbon sandstone deposits (U.S.)

occurrence and prospecting, 9: 5326(R)

Uranium–carbon sandstone deposits (Utah)

occurrence in Southern Utah, 9: 3466(J)

Uranium–carbon systems

thermal conductivity at 70°C, 9: 1879(J)

Uranium chelates

with 2,4-pentanedione, formation constants, enthalpy, and entropy, 9: 3390(J)

with 8-quinolinol, spectrophotometric studies, 9: 5630(J)

with 8-quinolinol and 5,7-dihalo derivatives, absorption spectra, 9: 131(J)

Uranium(III) chlorides

enthalpy, entropy, and specific heat of, from 0° to 727°C, 9: 6941

Uranium–chromium alloys

phase studies, 9: 2726

thermal conductivity at 70°C, 9: 1879(J)

Uranium complexes

absorption spectra of, with β-diketones, 9: 135(J)

with cupferron, preparation, crystal structure, and chemical reactions, 9: 6238

with F^-, Cl^-, SO_4^{2-}, and $(SCN)^-$, stability of, at various temperatures, 9: 5629(J)

Uranium compounds

polarographic behavior of, in molten ammonium formate, 9: 7292

polarographic determination of, in presence of Fe and Cu, supporting electrolytes for, 9: 1149(J)

Uranium–copper sandstone deposits (Ariz.)

occurrence in Ridenour Mine, 9: 7334

occurrence in Willaha Area, 9: 6652

Uranium–copper sandstone deposits (Utah)

occurrence in White Canyon Area, 9: 1512

Uranium crystals

preparation of alpha single, 9: 6236

Uranium deposits

associated with radioactive Fe minerals, 9: 5001(J)

Uranium deposits (Ariz.)

occurrence, 9: 1829

Uranium deposits (Colo.)

occurrence, 9: 1829

Uranium deposits (Idaho)

occurrence, 9: 1520(J)

Uranium deposits (Kan.)

occurrence in Clancey Mining District, 9: 1518(J)

Uranium deposits (Mont.)

occurrence, 9: 1520(J)

Uranium deposits (Nev.)

occurrence in Austin area, 9: 1257

occurrence in northern Nev., 9: 6963

Uranium deposits (N. Mex.)

occurrence, 9: 1829

Uranium deposits (U. S.)

mineral investigations resource appraisals map of, 9: 6968

prospecting for, types and distribution of, 9: 5651(J)

Uranium deposits (Utah)

occurrence, 9: 1829

Uranium deposits (Wyo.)

genesis and occurrence in Gas Hills area, 9: 1261(J)

occurrence in Mayoworth area, 9: 956(J)

Uranium(IV) fluoride–magnesium systems

thermal conductivity and thermal diffusion, 9: 1263

Uranium(IV) fluoride–sodium fluoride systems

magnetic susceptibilities of UF_4·NaF, UF_4·3NaF, and (γ)UF_4·2NaF, 9: 7737(J)

Uranium(III) fluorides

magnetic ground state, 9: 4655(J)

Uranium(IV) fluorides

chemical analysis for Cl, 9: 4385

fluorination of, in preparation of UF_6, reaction kinetics, 9: 3385

hydrated, preparation and properties, 9: 1210(J)

thermal capacity from 5 to 300°K, 9: 6868

molecular theory, 9: 4657(J)

preparation, hydration, thermogravimetric analysis, x-ray diffraction analysis, precipitation from aqueous solution, and reactions with hydrogen fluoride and aqueous hydrofluoric acid, 9: 1210(J)

thermal capacity and magnetic entropy, 9: 1231

Uranium(VI) fluorides

mass spectrographic analysis and preparation, 9: 7316

preparation of, by fluorination of UF_4, reaction kinetics, 9: 3385

Uranium glass

for thermal neutron measurements, in counters, 9: 5136(J)

Uranium–gold alloys

Uranium hexafluorides

(See Uranium (VI) fluorides.)

phase studies of, by thermal, metallographic, and x-ray methods, 9: 1147(J)

Uranium–graphite systems

buckling, multiplication factor, and thermal utilization factor, experimental determination, 9: 7925(J)

neutron multiplication, 9: 7888(J)

neutron resonance absorption measurements, 9: 7889(J)

neutron velocity and spectrum, 9: 7892(J)

Uranium hydride compacts

density of, 9: 600

Uranium hydrides

dissociation pressure and pyrophoricity of, over range from 300 to 625°C, 9: 600

magnetic properties, 9: 7983(J)

Uranium iodides

specific heat and magnetic susceptibility at 2.61°K, 9: 1067(R)

Uranium(IV) ions
absorption spectra, 9: 3001(J)
hydrolysis in perchlorate solutions at 10 to 43° C, 9: 6239(J)
hydrolysis of UO_2^{2+}, mathematical analysis, 9: 2620(J)
Uranium(VI) ions
chromatographic separation from metals, tracer study, 9: 5267(J)
reduction to U(IV) by $SnCl_2$ in HCl solutions, 9: 3804(J)
Uranium–iridium alloys
crystal structure of UIr_2, 9: 6944(J)
Uranium–iron–nickel alloys
pseudo-binary phase sections between Laves phases in, 9: 3353(J)
Uranium isotopes
chemical separation after proton irradiation of natural U, 9: 2673(J)
electrolytic separation of negative results, 9: 289
Uranium isotopes U^{230}
decay and low-lying states of spin 1– in, 9: 1633(J)
decay schemes and nuclear spectra, 9: 4863
Uranium isotopes U^{232}
decay properties, 9: 6143(J)
decay scheme, 9: 6121(J)
rotational levels, 9: 7525(J)
Uranium isotopes U^{233}
alpha cross sections, 9: 4705(R)
alpha cross sections (α,pxn), 9: 7272(R)
alpha spectrum, measurement, 9: 7905(J)
epithermal neutron fission, number of secondary neutrons in, 9: 7934(J)
fission fragments from 22-Mev proton bombardment, angular distribution, 9: 4654(J)
fission yields of Ce and Nd isotopes, 9: 7982
neutron capture cross section, 9: 7221(J)
neutron cross sections and reactor constants, 9: 5762
neutrons emitted in fission, measurements of average number, 9: 7932(J)
nuclear spins, 9: 5146(J)
optical spectra, hyperfine structure, 9: 5146(J)
slow neutron fission cross sections, and fission resonances, 9: 6557(J)
spectrum, hyperfine structure, 9: 6627(J)
thermal neutron fission cross section, 9: 6044(J), 6556(J)
thermal neutron fission yields, 9: 4656(J)
velocity fine structure of fission fragments, 9: 1365(J)
Uranium isotopes U^{234}
alpha spectrum, measurement, 9: 7905(J)
rotational levels, 9: 7525(J)
Uranium isotopes U^{235}
alpha cross sections, 9: 4705(R)
alpha cross sections (α,pxn), 9: 7272(R)
critical masses in water boilers, graphical method of obtaining, 9: 6141
decay schemes and nuclear spectra, 9: 4863
determination of, by radioactivation, 9: 2687(J)
distribution of fission products from, 9: 5776
epithermal neutron fission, number of secondary neutrons in, 9: 7934(J)
fission, average kinetic energy of fragments, 9: 5832(J)
fission, energy spectrum of γ rays from, 9: 7957
fission and total cross sections for 22-Mev protons in, 9: 738(J)
fission by 14-Mev neutrons, nuclear charge distribution and yield fine structure, 9: 7222(J)
fission cross section, ratio between boron cross section and, 9: 3002(J)
Uranium isotopes U^{235} (cont'd)
fission cross section, variation with energy in low-energy region, 9: 1145(J)
fission cross section data presented at Geneva conference, 9: 7101(J)
fission cross sections for 120- and 380-Mev neutrons, 9: 5156(J), 5778(J)
fission fragments from 22-Mev proton bombardment, angular distribution, 9: 4654(J)
fission of, short-period delay neutrons from, 9: 2919(J)
fission yield fine structure of, in mass region 99 to 106, 9: 670(J)
neutron absorption cross section of, 9: 1146(J)
neutron cross sections and reactor constants, 9: 5762
neutron fission, yields of Xe and Kr in, 9: 7601(J)
neutron fission cross section from 0.01 to 0.4 ev, 9: 3355(J)
neutron fission cross sections for, angular anisotropy of, 9: 6072(J)
neutron fission yields of I^{131}, I^{132}, I^{133}, I^{134}, and I^{135}, 9: 4653
neutrons emitted in fission, measurements of average number, 9: 7932(J)
nuclear spin, 9: 4272(J)
prompt fission γ rays, 9: 7957
proton fission of, yield and symmetry studies of, 9: 6144(J)
radiochemical determination of, in natural U, 9: 4388(J)
recovery from fuel elements at the Arco Chemical Plant, 9: 6187
slow neutron fission cross sections and fission resonances, 9: 6557(J)
spectrum, hyperfine structure, 9: 6627(J)
thermal neutron fission of, absolute fission yield of Ba^{140} in, 9: 467(J)
thermal neutron fission yields, 9: 4656(J)
thermal neutron fission yields of Sr^{89}, Y^{91}, and Y^{91} from, 9: 817
velocity fine structure of fission fragments, 9: 1365(J)
Uranium isotopes U^{237}
electron spectrum, 9: 7906(J)
Uranium isotopes U^{238}
alpha cross sections, 9: 4705(R)
alpha cross sections (α,xpn), 9: 7272(R)
deuteron reactions (d,n), cross section, 9: 2055(J)
disintegration constant, 9: 4323(J)
energy levels, spacings and neutron widths of, 9: 6045(J)
fission and total cross sections for 22-Mev protons on, 9: 738(J)
fission cross section, ratio between boron cross section and, 9: 3002(J)
fission cross sections for 120- and 380-Mev neutrons, 9: 5156(J), 5778(J)
fission fragments from 22-Mev proton bombardment, angular distribution, 9: 4654(J)
fission yield fine structure of, in mass region 99 to 106, 9: 670(J)
neutron absorption cross section of, 9: 1146(J)
neutron cross sections and reactor constants, 9: 5762
neutron fission, yields of Xe and Kr in, 9: 7601(J)
photofission of, yields from, and symmetric and asymmetric fission cross sections up to 300 Mev, 9: 6142(J)
thermal neutron absorption cross sections, 9: 6558(J)
thermal neutron activation cross sections, 9: 3970(J)
Uranium leach residues
leaching and roasting of, from cold acid U leaches, 9: 6619
nitric acid, U recovery from, 9: 601(J)
Uranium leach solutions
solvent extraction of U from, 9: 6942
Uranium leach solutions (acid)
determination of U in low-grade, 9: 7293
Uranium leach solutions (carbonate)
recovery of U and V, 9: 7728
sodium amalgam reduction for precipitation of U and V, 9: 7728

Uranium leach solutions (carbonate) (cont'd)
uranium recovery from, 9: 911(J), 5549(P)
Uranium–manganese–nickel alloys
pseudo-binary phase sections between Laves phases in, 9: 3353(J)
Uranium minerals
(See also specific minerals by name; see also Uranium ores.)
age determination by Pb isotopic ratios, 9: 2712(J)
age determination of, from the isotopes ratios Pb^{206}/U^{238}, Pb^{207}/U^{235}, or Pb^{207}/Pb^{206}, 9: 5648(J)
carbonate leaching under high temperature and pressure, 9: 6226
correlation chart of, 9: 954(J)
fluorometric and colorimetric microdetermination of U in, 9: 134(J)
glossary and chemical classification of, 9: 3465(J)
gummite, spectrographic analysis of, 9: 6560(J)
properties and synthesis, 9: 4451(J)
radon leakage from, 9: 4999(J)
Uranium minerals (Nev.)
occurrence, 9: 1260(J)
Uranium–nickel alloys
preparation and properties, 9: 1431(P)
Uranium–niobium alloys
determination of Sn and Zr in ternary, 9: 4074
Uranium nitrides
formation of, by reaction of N with U, 9: 5309(J)
Uranium ore processing plants
for Al recovery, 9: 7257
design and cost estimates for processing Florida leached zone material, 9: 6879
design and operation of, for carbonate leaching of U ores, 9: 5250
design of, for processing Florida leached zone material, 9: 7270
design of, for U recovery, 9: 7673
at Fernald, Ohio, for conversion of ore to metal, 9: 7602(J)
operation of the Monticello (Utah) mill, 9: 5338(J)
Uranium ores
(See also Uranium minerals.)
acid cure of, for recovery of U_3O_8, 9: 5923(J)
acid pressure leaching of, containing sulfidic minerals, 9: 3156(J)
acid pugging and curing of, 9: 4146
age, origin, and sedimentary environments of, on Colorado Plateau, 9: 6272(J)
amenability tests of, by ammonium carbonate leaching, 9: 4145(R)
ammonium carbonate leaching, 9: 4145(R), 5297(R)
beta ionization intensity from, 9: 5814
carbonate leaching, 9: 911(J), 5250
classification, 9: 2711(J)
dissolution by sugar carbon–sodium fusion, ignition bomb for, 9: 7736
electronic concentration of low grade, with Lapointe picker, 9: 2242
extraction of U from, in Norway, 9: 3155(J)
flotation methods for, 9: 1432(P)
fluorimetric and colorimetric microdetermination of U in, 9: 134(J)
leach pilot plant for, tracer techniques for study of flow through agitators of, 9: 2261
leaching of, review, 9: 3162(J)
lithographic controls in sandstone deposits of, on Colorado Plateau, 9: 6273(J)
occurrence in Monument Valley district, Arizona, guides for, 9: 6274(J)
oxidation state of, of Colorado Plateaus, relation of thermodynamic relations among V oxides to, 9: 1474(J)
polarographic determination of U in, effect of impurities and additives on, 9: 133(J)
processing, carbonate leaching, and U recovery, 9: 7275
Uranium ores (cont'd)
processing, operating procedures for the Monticello (Utah) mill for, 9: 5338(J)
processing for recovery of U and V, 9: 6619
processing for U recovery by ion exchange, 9: 6865
processing of Florida leached zone material for U, P, and Al recovery, 9: 7271
radiometric analysis of, for U, 9: 878
recovery of U from, by solvent extraction, 9: 6942
uraninite-bearing pegmatite in Saskatchewan, mineralogy of, 9: 6278(J)
volumetric determination of U in presence of Fe in poor, 9: 2228(J)
Uranium–osmium alloys
crystal structure of UOs_2, 9: 6944(J)
Uranium(IV) oxalates
magnetic susceptibility, 9: 7737(J)
Uranium oxide–calcium oxide systems
oxidation of, phase diagrams, 9: 1796(J)
Uranium oxide–cerium oxide systems
crystal structure and electric conductivity, 9: 7277(J)
phase studies and crystal structure, 9: 7278(J)
Uranium(IV) oxide compacts
thermal expansion of sintered, 9: 1699
Uranium oxide–erbium oxide systems
phase studies and crystal structure, 9: 7679(J)
Uranium oxide–lanthanum oxide systems
crystal structure and physical properties, 9: 7318(J)
Uranium oxide–magnesium oxide systems
oxidation of, phase diagrams, 9: 1796(J)
phase studies, 9: 925
Uranium oxide–neodymium oxide systems
crystal structure and physical properties, 9: 7318(J)
phase studies, 9: 925
Uranium(IV) oxide–phosphoric acid systems
phase studies, 9: 129
Uranium oxide powders
thermal conductivity of, in gases and gas mixtures between 200° and 1500°F, 9: 4342
Uranium oxide–praseodymium oxide systems
phase studies and crystal structure, 9: 6943(J)
Uranium oxide–samarium oxide systems
crystal structure and physical properties, 9: 7318(J)
Uranium oxide–scandium oxide systems
crystal structure and physical properties, 9: 7318(J)
Uranium(VI) oxide–sodium oxide–water systems
equilibrium phase relations in, 9: 58
Uranium oxide–thorium oxide systems
chemisorption of O_2 on, 9: 603(J)
crystal structure and physical properties, 9: 7319(J)
electric conductivity, 9: 7277(J)
oxidation of, phase diagrams, 9: 1796(J)
oxygen exchange studies, 9: 4705(R)
preparation, crystal structure, phase studies, density, and oxidation, 9: 602(J)
Uranium oxide–yttrium oxide systems
crystal structure and physical properties, 9: 7318(J)
oxidation of, phase diagrams, 9: 1796(J)
phase studies, 9: 4486(J), 7678(J)
Uranium oxide–zirconium oxide systems
x-ray diffraction patterns, 9: 127
Uranium oxides
colorimetric analysis of, for P, 9: 7696

Uranium oxides (cont'd)
equilibriums of, between UO_2 and U_3O_8, 9: 1795(J)
filtration of fume, design and performance of equipment for, 9: 6945
oxidation and reduction in water suspension, 9: 7317
phase studies, of between UO_2 and U_3O_8, 9: 1794(J)
phase studies and crystal structure of $UO_{2.8}$ to U_3O_8, 9: 2685(J)
Uranium(IV) oxides
carbonate leaching under high temperature and pressure, 9: 6226
chemisorption of O_2 on, 9: 603(J)
fluorination with hydrogen fluoride and aqueous hydrofluoric acid, 9: 1210(J)
oxidation of, kinetics and mechanisms of, 9: 1796(J)
production of reactor fuel rods from, 9: 3711(J)
spectra, thermodynamic properties, and vaporization, 9: 7981
thermal conductivity at 70°C, 9: 6868
thermal expansion, 9: 1266
Uranium(IV-VI) oxides
crystal structure, 9: 7679(J)
dusts of, relation of particle size to toxicity following inhalation by animals, 9: 1731(J)
preparation from salt samples and fluorination to UF_6, 9: 7316
production of, from ores in Norway, 9: 3155(J)
recovery from ores, acid curing process for, 9: 5923(J)
Uranium(VI) oxides
production from waste solutions by drying and calcining, 9: 6634
Uranium–oxygen systems
constitution diagrams of showing composition vs total pressure at 900°K, 9: 7981
Uranium–palladium alloys
crystal structure of UPd_3, 9: 6944(J)
Uranium–platinum alloys
crystal structure of UPt_3, 9: 6944(J)
Uranium Production Reactor
control rod drive unit latch, design and performance, 9: 6478
Uranium reserves
occurrence in Idaho, Utah, and Wyoming, 9: 2263
Uranium–ruthenium alloys
crystal structure of URu_3, 9: 6944(J)
Uranium(IV) salts
electrophoresis, 9: 2684(J)
Uranium–silicon systems
determination of Si in, 9: 4074
Uranium–sodium fluoride systems
preparation, 9: 927(J)
Uranium(IV) sulfates
magnetic susceptibility, 9: 7737(J)
Uranium sulfides
composition at various temperatures, 9: 3119(J)
physical properties of U_2S_3 and U_2S_3, 9: 3352(J)
Uranium tetrafluorides
(See Uranium (IV) fluorides.)
Uranium–tin alloys
radiation effects, photomicrographic specimen for study of, 9: 7373(J)
Uranium–titanium alloys
metallographic, x-ray, and dilatometric study of, 9: 7013(J)
phase studies by thermal, microscopic, and x-ray analysis from 0 to 30 at.% Ti, 9: 1543(J)
Uranium–tungsten alloys
phase studies, 9: 4471(J)
Uranium–vanadium sandstone deposits (Ariz.)
occurrence in Defiance Uplift, 9: 1828
occurrence in Ridenour Mine District, 9: 7334
Uranium–vanadium sandstone deposits (Colo.)
occurrence in Horse Range Mesa Quadrangle, 9: 7775(J)
occurrence in Uravan District, 9: 2266(J)
Uranium–vanadium sandstone deposits (Utah)
occurrence in Polar Mesa, 9: 160
occurrence in Seven Mile Canyon Area, 9: 6964
Uranium–vanadium sandstone deposits (Wyo.)
occurrence in Pumpkin Buttes Area, 9: 627(J)
Uranium–zirconium alloys
explosive properties of, during dissolution, etching, and pickling in nitric acid and HCl–ethyl acetate solutions, 9: 127
microstructure, phase studies, and x-ray diffraction patterns, 9: 127
phase studies, 9: 3354(J)
thermal conductivity at 70°C, 9: 1879(J)
Uranocircites
genesis and occurrence of, 9: 3158(J)
Uranophanes
properties and occurrence, 9: 6656(J)
Uranyl carbonates
crystal structure, 9: 3437(J)
Uranyl chlorides
colorimetric analysis for micro-amounts of B, 9: 2163
effects on adenosinetriphosphatase of myosin, 9: 4760(J)
potentiometric reduction of, with $CrCl_2$, 9: 2686(J)
structure of dilute aqueous solutions of, thermochemical investigation, 9: 132(J)
Uranyl chromate–water systems
phase studies and melting point, 9: 3384
Uranyl chromates
preparation, 9: 3384
Uranyl compounds
crystal chemistry, 9: 2372(J)
spectroscopy of salts in the solid state, review of early studies, 9: 4978
Uranyl ions
absorption by clays of, 9: 6559(J)
determination of, involving chelation with ethylenediaminetetraacetic acid, 9: 3436(J)
electronic structure and magnetic properties, 9: 4035(J)
equilibrium formation constants for reaction in aqueous solution of acetylacetonate ion with, 9: 1752(J)
hydrolysis, 9: 3438(J)
hydrolysis and dissociation, 9: 6635(J)
photochemical reactions, 9: 928(J)
separation by ion exchange, 9: 910(J)
Uranyl nitrate–butyl phosphate–nitric acid systems
uranium solvent extraction from, performance of a louvre-plate redistributor for large-diameter pulse columns in, 9: 588(J)
Uranyl nitrate–ethyl ether–water systems
distribution coefficients in, 9: 7312(J), 7313(J)
Uranyl nitrates
calcination, drying, and decomposition for production of UO_3, 9: 6634
spectrophotometric determination of trace amounts of Ti in, 9: 6199(J)
structure of dilute aqueous solutions of, thermochemical investigation, 9: 132(J)
Uranyl sulfate–water systems
viscosity of 0.176 to 2.865 molal, from 20 to 90°C, 9: 1490
Uravan District (Colo.)
geology, geophysical exploration for U–V occurrence in, 9: 2266(J)

Uravan ores
(See Carnotites.)

Uravan Quadrangle (Colo.)
preliminary geologic map of, 9: 6270(J)

Urea
synthesis by radiation of ammonia, methyl chloride, and m-phenylenediamine in methanal, 9: 4109(J)

Urea, thio-
protective effects against x radiation in mice, 9: 3034(J)

Urine
amino acid and corticosteroids in, effects of exposure to total-body irradiation, 9: 2566(J)
chromatographic determination of free amino acids in, 9: 5261
colorimetric analysis of, for fluorides, 9: 4076
determination of B in, 9: 53
determination of Hg in, 9: 5256
determination of desoxyribonucleases in, following exposure to total-body irradiation in rats, 9: 23(J)
electrochemical analysis of, for Po, 9: 5257
from patients with proteinuria, chemical analysis, 9: 5206(R)
radiometric determination of U in, 9: 7291
rat, separation of Ac^{227} from, 9: 2671

Utah
exploration of Henry Mountains Area in Wayne and Garfield counties, 9: 3466(J)
exploration of Kaiparowits Plateau Area in Garfield and Kane counties, 9: 3456(J)
exploration of Kolob Terrace Area in Kane, Washington, Garfield, and Iron counties, 9: 3466(J)
mineral association in U deposits, 9: 1829
photogeologic map of Carlisle Quadrangle in Wayne, San Juan, and Garfield counties, 9: 6983(J)

Utah (Duchesne Co.)
airborne radioactivity survey map of Myton Area in, 9: 5046(J)

Utah (Emery Co.)
mineralogy of Delta deposit in, 9: 4998
photogeologic map of Emery Quadrangle in, 9: 3833(J), 4446(J), 4447(J)
photogeologic map of Tidwell Quadrangle in, 9: 3159(J), 3834(J), 7770(J), 7771(J)
photogeologic map of Woodside Quadrangle in, 9: 3831(J)
occurrence of rabbittites in, 9: 3829(J)

Utah (Garfield Co.)
geophysical exploration of Circle Cliffs upwarp in, 9: 6651
photogeologic map of Carlisle Quadrangle in, 9: 2269(J)
photogeologic map of Circle Cliffs Quadrangle in, 9: 4147(J), 4148(J), 4149(J), 4448(J), 4449(J), 4450(J), 5006(J), 5007(J), 5008(J), 5009(J), 5010(J), 5011(J), 5012(J), 5013(J), 5034(J)
photogeologic map of Desert Lakes Quadrangle in, 9: 2270(J)
photogeologic map of Kaiparowits Peak Quadrangle in, 9: 3469(J)
photogeologic map of Mount Pennell Quadrangle in, 9: 5028(J), 5029(J), 5030(J), 5031(J), 5032(J)
photogeologic map of Notom Quadrangle in, 9: 5016(J)
photogeologic map of Orange Cliffs Quadrangle in, 9: 5005(J)
photogeologic map of White Canyon Quadrangle in, 9: 5015(J), 5018(J)

Utah (Grand Co.)
exploration of Moab–Dewey Bridge Area in, 9: 1256
geology of Seven Mile Canyon Area in, 9: 6964
geophysical exploration of Polar mesa in, 9: 160
guidebook to the geology of, 9: 5049(J)
photogeologic map of Moab Quadrangle in, 9: 5039(J), 7766(J), 7767(J), 7768(J)
photogeologic map of Tidwell Quadrangle in, 9: 7769(J), 7771(J)
stratigraphy of Yellow Cat Area in, 9: 2262(R)

Utah (Kane Co.)
photogeologic map of Circle Cliffs Quadrangle in, 9: 5010(J), 5013(J)
photogeologic map of Mount Pennell Quadrangle in, 9: 5031(J), 5033(J)
photogeologic map of Navajo Mountain Quadrangle in, 9: 6974(J), 6985(J)
photogeologic map of Straight Cliffs Quadrangle in, 9: 5019(J), 5020(J), 5021(J), 5022(J), 6989(J)

Utah (San Juan Co.)
exploration of Wray Mesa in, 9: 1513
geology of Blanding District in, 9: 2262(R)
geophysical exploration of White Canyon Area in, 9: 1512
geology of, guidebook to, 9: 5049(J)
photogeologic map of Aneth Quadrangle in, 9: 7772(J), 7773(J), 7774(J)
photogeologic map of Bluff Quadrangle in, 9: 5035(J), 5036(J), 5041(J), 5042(J), 6972(J), 6988(J)
photogeologic map of Carlisle Quadrangle in, 9: 2269(J), 3832(J), 6976(J), 6977(J), 6978(J), 6979(J), 6980(J), 6981(J), 6982(J), 6984(J)
photogeologic map of Clay Hills Quadrangle in, 9: 5033(J), 5040(J), 5043(J), 6986(J), 6987(J)
photogeologic map of Desert Lakes Quadrangle in, 9: 2270(J)
photogeologic map of Elk Ridge Quadrangle in, 9: 3467(J), 5004(J), 5014(J), 5017(J), 5037(J), 5038(J), 6971(J)
photogeologic map of Navajo Mountain Quadrangle in, 9: 5023(J), 5024(J), 5026(J), 5027(J), 6985(J)
photogeologic map of Orange Cliffs Quadrangle in, 9: 5005(J)
photogeologic map of White Canyon Quadrangle in, 9: 5015(J), 5018(J)

Utah (Uintah Co.)
airborne radioactivity survey map of Myton Area in, 9: 5046(J)

Utah (Wayne Co.)
geochemical prospecting in the Capitol Reef Area in, 9: 5047(J)
photogeologic map of Carlisle Quadrangle in, 9: 6977(J), 6978(J)

Utah. Univ., Salt Lake City. Inst. for the Study of Rate Processes
progress reports on power factor of nitrogen fixation, 9: 5987(R)

V

V particles
(See also S particles.)
cloud chamber investigations and summary properties, 9: 4858
decay of charged, 9: 324(J)
disintegration, 9: 2808
mass of, and decay products, calculation, 9: 331(J)
nature and frequency of, in $\pi + N \rightarrow Y + K$, 9: 5741(J)
nature of, similarity to τ^* mesons, 9: 334(J)
neutral, energy spectra and production frequency of, 9: 5985(J)
neutral, from decay of negative hyperon, 9: 4546(J)
production by interaction of 1.37-Bev π mesons with protons, 9: 4257(J)
production of neutral, by Cosmotron neutrons, 9: 3270(J)
production of pairs of, orientation of planes in, 9: 1989(J)
production processes, theory, 9: 7485(J)
review of, in Annual Review of Nuclear Science, 9: 3957(J)
theoretical investigation of the charge independence hypothesis of, 9: 7594(J)

Vacuum
dielectric properties, 9: 1368
polarization in classical electromagnetism, 9: 4826(J)

Vacuum furnaces
design, operation and calibration, 9: 7783(R)
design and operation of, for glass-metal bonding systems, 9: 6648(R)

Vacuum furnaces (cont'd)
design of, 9: 989(R)
development and operation of high-temperature quenching, 9: 930(J)
laboratory, design and specifications, 9: 3420
Vacuum gages
(See also Pressure gages.)
design, 9: 1579(R)
ionization, electrometer circuit, 9: 4210(R)
ionization, non linearity of, 9: 7025(R)
ionization, protective circuit for, 9: 5705
recording Langmuir viscosity type, 9: 1025(J)
ultra-high, multicircuit control for, 9: 282(J)
Vacuum fusion analysis
apparatus for, of gases in metals, 9: 3406(J)
Vacuum pumps
(See also Diffusion pumps; Jet pumps.)
automatic Toepler and circulating, design, 9: 5639(J)
control circuits for, design, 9: 3243(J)
design, 9: 1427(P)
design and performance of absorption, using Ba as absorbing medium, 9: 1368
Vacuum seals
(See also Seals and Glands.)
design of demountable flangeless, 9: 691(J)
electron diffraction camera specimen chamber, 9: 690(J)
glass-to-metal, employing O-rings and glass tubing, 9: 5632(J)
Vacuum systems
adsorbed water in, elimination of, by means of methychlorosilane, 9: 944(J)
argon behavior in, tracer study, 9: 4436(J)
design and operation of, for 300-Mev nonferromagnetic synchrotron, 9: 6086
electron diffraction camera specimen chamber, 9: 690(J)
evaporation apparatus, vacuum valve and ion gage protective circuit for, 9: 5705
for handling reactive and nonreactive gases, 9: 546
for high-energy accelerators, review, 9: 5784(J)
leak detection in, 9: 7055
lock design for mass spectrometers for insertion of solid materials, 9: 7878(J)
manual for, in electromagnetic separation plant, 9: 145
outgassing by ionization bombardment, 9: 6352
use of indium in, 9: 5407
Vacuum techniques
manual for, in electromagnetic separation plant, 9: 145
Vacuum valves
(Including stopcocks; see also Values.)
all-glass, for obtaining ultra-high vacuum, 9: 146(J)
design, for mass spectrometer, 9: 4705(R)
design, performance, and testing of pressure-vacuum diaphragm, 9: 3818
design of grease-free mercury float, 9: 7266(R)
design of Hg, for mass-spectrometer gas-handling system, 9: 7852
design of metal-to-metal, 9: 5409(J)
indium uses in, 9: 5407
seal-off, design, 9: 614(J)
simplified construction of, 9: 1499(J)
umbrella type, for vacuum evaporation apparatus, 9: 5705
Vacuum vessels
design of large, 9: 144
Valves
(See also Vacuum valves.)
cast iron, for molten Al, 9: 191
corrosive fluid effect on, 9: 6960(J)
cylinder, stress corrosion cracking of Al bronze bonnets on, 9: 3149(J)
design, 9: 1428(P)
design of electromagnetic, for Wilson cloud chamber, 9: 1612(J)
glass bellows, design, 9: 5631(J)
liquid metal, cleaning with ammonia, 9: 4175(R)
for liquid metals, testing, 9: 4179(R)
nickel diffusion leaks for regulating purified supply of H_2, 9: 3440(J)
piston operated, suitability for sodium service, 9: 5318
testing for liquid metal systems, 9: 6999(R)
testing in liquid metals, 9: 4175(R), 5657(R)
Van de Graaff accelerators
four million volt, design and performance, 9: 1368
Kansas Univ., design, 9: 5782(R)
magnet current regulator, 9: 7559(J)
performance of, for radiotherapy, 9: 7253(R)
pulsed ion source design, 9: 3666(J)
voltage surges and breakdown conditions, 9: 2467(J)
Vanadium
absorptiometric analysis, 9: 7295
amperometric determination of, in Ti-base alloys, 9: 6290
by-product recovery from leach liquors, 9: 6619
energy levels study by means of electric excitation by protons, 9: 5476(J)
intermetallic compound with Sn, preparation and structure, 9: 3878(J)
iodometric determination, 9: 3072(J)
magnetic susceptibility at liquid He temperatures, measurement, 9: 4209
neutron-diffraction studies of superconducting state, 9: 3218(J)
neutron scattering, energy distribution measurements, 9: 7386
precipitation of, from carbonate leach solutions using sodium amalgam, 9: 7728
preparation of, by reduction of V_2O_3, 9: 4181
production by reduction of V_2O_3, 9: 5554(P)
production of, by bomb reduction of V_2O_3 with Ca, 9: 983(J)
spectrographic determination in Ti and Ti alloys, 9: 639(R)
spectrographic determination of, in ores and rocks, 9: 162
spectrophotometric determination of, with Na vanadate, 9: 86(J)
structure of carbide phases of, 9: 1866(J)
volumetric determination of, Ti and Ti alloys, 9: 4944
x-ray spectra (soft), 9: 452(J)
Vanadium alloys
oxidation, phase studies, and mechanical properties, 9: 3516(R)
oxidation and mechanical properties, 9: 3517(R)
properties and reactor applications, 9: 6476
Vanadium–aluminum–carbon–titanium systems
tensile properties, 9: 3853(R)
Vanadium–aluminum–tin–titanium alloys
fabrication and physical properties, 9: 2717(R)
Vanadium–aluminum–titanium alloys
aging characteristics and tensile, bend, and hardness properties of as-rolled and heat treated welded and unwelded, 9: 3499(R)
electroplating and tensile properties, 9: 3853(R)
fabrication, by powder metallurgical treatment, 9: 7785
fabrication, heat treatment, and effect of section size on mechanical properties, 9: 1534

Vanadium–aluminum–titanium alloys (cont'd)
hardness, crystal structure, and phase studies, 9: 3520
hardness of, water quenched from 1000°C, 9: 1842(R)
heat treatment, mechanical properties, microstructure, and phase studies, 9: 7000
melting techniques and forging temperatures for preparation of, 9: 1850(R)
partial isothermal sections of, at 800, 900, 1000, and 1200°C, 9: 1843(R)
phase studies, 9: 1844(R)
tensile properties and microstructure, effects of heat treatment on elevated-temperature, 9: 2719(R)
tensile strength, yield strength, and bendability, effects of heat treatment on, 9: 5656(R)

Vanadium borides
preparation by vacuum technique, 9: 1821(J)

Vanadium carbides
properties of, effect of molten Tl on, 9: 2247

Vanadium–chromium–iron–manganese–molybdenum–titanium alloys
heat treatment, mechanical properties, phase studies, tensile properties and welding, 9: 2298
tensile properties, hardness, and flash weldability, 9: 3856

Vanadium–chromium–titanium alloys
constitution diagrams and mechanical properties, 9: 4187
hardness, heat treatment, mechanical properties, phase studies, and welding, 9: 2298

Vanadium compounds
polarographic behavior of, in molten ammonium formate, 9: 7292

Vanadium hydroxides
free energy change for formation from constituent ions, 9: 1474(J)

Vanadium(II) ions
free energy of formation and oxidational potential, 9: 1474(J)

Vanadium(III) ions
free energy of formation and oxidational potential, 9: 1474(J)

Vanadium–iron–titanium alloys
fabrication and physical properties, 9: 2717(R)
microstructure, hardness, and tensile properties of welded and unwelded, 9: 3493(R)

Vanadium isotopes
Szilard-Chalmers concentration, 9: 1959(J)

Vanadium isotopes V^{47}
gamma spectra from deuteron bombardment, 9: 734
positron half life, determination of, 9: 1685

Vanadium isotopes V^{48}
capture-positron branching ratios, 9: 1674(J)
gamma spectrum and decay scheme in isobaric triplet Cr^{48}–V^{48}–Ti^{48}, 9: 6056(J)

Vanadium isotopes V^{49}
K-capture decay, 9: 2061(J)

Vanadium isotopes V^{51}
Coulomb excitation functions and energy levels for, bombarded with 3.5-Mev α particles, 9: 423(J)
energy levels, 9: 2331(R), 6458(J)
proton scattering, 9: 7098

Vanadium isotopes V^{52}
existence of 23-hour, evidence against, 9: 7201(J)

Vanadium–molybdenum alloys
creep-rupture strength of, 9: 633
forging in inert gas, 9: 984(J)

Vanadium–molybdenum–titanium alloys
phase studies, 9: 1844(R)
phase studies and hardness of, cooled by oil, water, and air, 9: 1843(R)

Vanadium ores
processing, operating procedures for the Monticello (Utah) mill for, 9: 5338(J)

Vanadium oxides
absorptiometric analysis, 9: 7295
bomb reduction of, with Ca for production of V, 9: 983(J)
calcium reduction to V, 9: 4181
chemical stability in water solution at 25°C as functions of pH and oxidation potential, 9: 1474(J)
heat and free energy of formation, 9: 529(J)
phase relations at temperatures 650 to 1000°C, 9: 1468(J)

Vanadium(V) oxides
reduction of, to produce ductile massive V, 9: 5554(P)
x-ray powder diffraction patterns and solubility in $HClO_4$–NH_4ClO_4 solutions, 9: 60

Vanadium–titanium alloys
mechanical properties and phase studies, 9: 5666
mechanical properties and welding, 9: 4789(R)
notch sensitivity, 9: 1549(J)
phase studies, plastic deformation, and crystal structure, 9: 4463
preparation by nonconsumable and consumable electrode arc melting, 9: 2293(R)
retention of soft β in ice-brine quenching of, containing $\geq$ 15%, 9: 1841(R)
room-temperature dynamic elastic modulus and its ratio to density, 9: 2728(R)
structure of ω-phase, 9: 4815(J)
x-ray diffraction analysis, hardness, thermal expansion, electric conductivity, phase studies and heat treatment, 9: 2763(J)

Vanadium–titanium–molybdenum alloys
hardness, influence of cooling rate on, 9: 1842(R)

Vanadium–uranium sandstone deposits (Ariz.)
occurrence in Defiance Uplift, 9: 1828
occurrence in Ridenour Mine District, 9: 7334

Vanadium–uranium sandstone deposits (Colo.)
occurrence in Horse Range Mesa Quadrangle, 9: 7775(J)
occurrence in Uravan District, 9: 2266(J)

Vanadium–uranium sandstone deposits (Utah)
occurrence in Polar Mesa, 9: 160
occurrence in Seven Mile Canyon Area, 9: 6964

Vanadium–uranium sandstone deposits (Wyo.)
occurrence in Pumpkin Buttes Area, 9: 627(J)

Vanadium Wedge Mine (Nev.)
exploration, 9: 1260(J)

Vanadyl ions
absorption spectra and thermodynamic functions in $HClO_4$ solution at 25°, 9: 60

Vapor pressure
convenient method for measuring, 9: 4746
determination of, for materials of low volatility, equipment for, 9: 6330
measurement, by the Knudsen effusion method, analysis, 9: 4477
measurement by differential apparatus for radioactive materials, 9: 5410(J)
measurement by isotopic exchange, 9: 5592(J)
measurement by microwave refractometry, 9: 7057
measurement by tracer technique in solids, 9: 1188(J)
of metals, determination with radioisotopes, 9: 1883(J)
of sodium and potassium chloride solutions in light and heavy water, apparatus for determination of, 9: 524(J)

Vapor valves
(See Vacuum valves.)

Vein deposits (Ariz.)
occurrence in Lulu Belle Claims, 9: 5325

Vein deposits (Nev.)
occurrence in northern Nev., 9: 6963

Vein deposits (U.S.)
occurrence of U bearing, 9: 5326(R)

Velocity
measurement, design of a barium-titanate accelerometer for, 9: 6242

Ventilation
effectiveness of lignin paper filters in removal of dust and microorganisms from air of inhabited rooms, 9: 3361(J)

Vespidae
effects of delayed oviposition on x-ray-induced sterility in Habrobracon, 9: 3736(J)
effects of high-tension oxygen on pupa of Habrobracon, 9: 1729(J)
effects of rearing Habrobracon young on P^{32}-labeled larvae, 9: 5225(J)
haploid and diploid embryos of Habrobracon, as test organisms in evaluations of cell poisons, 9: 5577(J)

Vibration testing
in materials and structures, design of a resonance vibration exciter and controller, 9: 7746

Vibrations
effect on heat transfer in air, 9: 5316(J)
energy exchange and relaxation times of, review of theory and experiments on, 9: 7393

Victoreen Instrument Co., Cleveland
progress reports on current regulator tube reliability, 9: 3546

Vinyl compounds
explosive properties of polyvinyl nitrates, 9: 1747(J)

Vinyl fluoride
(See Ethylene, fluoro-.)

Virgin Valley Opal District (Nev.)
geology and U distribution, 9: 1260(J)
geology and U occurrence, 9: 6963

Virginia
gadolinium minerals distribution in, 9: 7335

Viruses
(See also Influenza virus.)
poliomyelitis, effects of radiation on, 9: 491(J)
of poliomyelitis, radioinduced inactivation, 9: 3737(J)

Viscometers
design and performance of, for fluid measurement at elevated temperature, 9: 2332
design of, for measurement of viscosities of binary gas mixtures, 9: 3213

Viscosity
measurement at high temperatures, 9: 2822

Vita-Var Corp., Newark, N. J.
progress reports on development of a coating and pretreatment for metals, 9: 947(R)

Vitamin B_{12}
labeled with Co^{58}, preparation and use in tracer studies, 9: 1177(J)
protective effects of, against radiation injuries in guinea pigs, 9: 6583(J)
retention of Co^{58} in, 9: 2104(J)

Vitamin C
(See also Ascorbic acid.)
exclusion from diet, effects on radiosensitivity of tumors in laboratory animals and man, 9: 3043(J)

Vitamin P
chemical properties and physiological effects, 9: 3388(J)
effects of therapy with, on radiation injuries in cancer patients, 9: 639(J)

Vitamins
effects of ionizing radiations on essential, in aqueous media, 9: 106
effects of radiation on, review of literature, 9: 2549

Voltage breakdown
(See Dielectric breakdown.)

Voltage regulators
(See also Power supplies.)
degenerative circuit, for 10 to 100 kv, 9: 1949(J)
transistor, design, 9: 7070(R)

Voltmeters
design of, for measuring high-voltage surges, 9: 7434(J)

Volumetric analysis
high-frequency titrations of divalent metals using ethylenediaminetetraacetic acid, 9: 2169(J)
neutralization titrations in anhydrous formic acid, 9: 523(J)
reductometric titrations in glacial acetic acid, 9: 536(J)
titrations in glacial acetic acid based on formation of insoluble salts, 9: 535(J)

W

Wasatch Formation (Wyo.)
geology and U distribution, 9: 627(J)

Wasps
(See Vespidae.)
radioinduced recessive lethals in mature sperm of Mormoniella, 9: 5846(J)

Waste disposal
(See also Sewage; Stack disposal; Waste processing.)
of contaminated laboratory equipment by burial, 9: 4417(J)
by fission-product adsorption on montmorillonite, 9: 929(J)
following adsorption on montmorillonite clay, 9: 1234
liquid, at Brookhaven, summary of data, 9: 2099(R)
liquid, from laboratories, systems and equipment for, 9: 6636
of materials containing α and β particles, by dilution, 9: 4049
problems and factors in, 9: 7751(J)
radioactive, in ocean, techniques for, 9: 1246(J)
in sea, methods of packaging, 9: 2099(R)
vapor compression evaporation, at BNL, 9: 2701(J)

Waste processing
(Treatment of radioactive wastes prior to disposal; see also appropriate subheadings under specific materials; see also Waste disposal.)
by adsorption on montmorillonite clay, 9: 1234
efficiency, application of sequential factorial designs to studies of, 9: 1235
by electromigration through ion exchange membranes, 9: 1500(J)
filter for, description of, 9: 6716(J)
of high-activity aqueous waste streams, performance of continuous calciner, 9: 3120(R)
by ion exchange, review, 9: 3106(J)
for removal of long-lived fission products, pilot plants, 9: 4504(R)
cation exchange materials using, 9: 1501(J)

Waste solutions
design of proportional sampler for, 9: 2656(J)

Water
(See also Ground waters; Ice; Rain water; Sea water; Steam; Surface waters.)
absorption of x radiation by, 9: 2038(J)
alkali-activated transformation of, by graphite, effects of oxide additives on, 9: 4931
analysis, review, 9: 4082(J)

Water (cont'd)

assay for H^3, 9: 5628(J)

attenuation of γ and neutron radiation from a swimming pool reactor, 9: 7151

attenuation of neutron and γ radiation from Bulk Shielding Reactor, 9: 7957

boiling, heat exchange in, effect of material and surface treatment on, 9: 7323(J)

boiling, maximum and minimum values of heat transmitted from metal surfaces to, under atmospheric pressure, 9: 3129(J)

boiling burnout measurements, 9: 4131

boiling in inclined tubes, velocity effect on heat-transfer coefficient, 9: 5940(J)

cavitation, theory and mathematical analysis of, 9: 6249(J)

chemical reactions with liquid metals, 9: 4179(R)

content in seed, effect on radiosensitivity, 9: 483(J)

corrosion of Al–Tin–Zn, Al–Si–Zn, Mg–Sn, Sn–Zn, Sn, and Al–Zn-soldered Al joints in 95°C, low-conductivity, aerated, distilled, 9: 2725

corrosion of Al, Zn, steel, and Zn–stainless steel and Al–stainless steel couples by, inhibition with Na dichromate–chloramine mixtures, 9: 153

corrosion of stainless steel and Si bronze auxiliary boilers and component parts by chlorinated and alkalized and pure deionized, 9: 3168

corrosive effects of, at high temperatures, 9: 3459

corrosive effects of high-temperature, on reactor structural materials, descaling methods, 9: 154

corrosive effects of 95°C, aerated, distilled, on 2S aluminum, 9: 5352

corrosive effects on Al, effects of high-level γ radiation and temperature on, 9: 7755

corrosive effects on Al, studied by radioactive tracers, 9: 2257(J)

corrosive effects on Al soldered joints, 9: 193(J)

corrosive effects on brass, bronze and cast Fe, 9: 3148(J)

corrosive effects on cold-worked and annealed Al, 9: 2252

corrosive effects on Fe, texture of γ-$Fe_2O_3 \cdot H_2O$ crystals from, 9: 886(J)

corrosive effects on structural materials at 600 and 680°F, 9: 1822

corrosive effects on Zr, Fe–Zr, and Ni–Zr alloys, 9: 7331

decomposition by radiation, 9: 7155(J)

effect on the vapor tension and calorimetry of 100% and aqueous solution of nitric acid, 9: 2140(J)

electron-induced decomposition, relation to mass spectrometric C_3^+ measurement in graphite vapor, 9: 105(J)

equation of state, 9: 987, 5588

evaporation rate of, pressures and rates of, 9: 937

explosions of molten Al, Mg, and KCl–NaCl with, prevention of, 9: 1743

fast neutron attenuation, effect of cylindrical ducts, 9: 7957

films and vapor, stopping of α particles by, 9: 3311(J)

formation of H_2O_2 in, effects of visible light irradiation on, 9: 6611(J)

fresh, abundance of O^{18} in, 9: 1952(J)

gamma attenuation, 9: 2983

gamma penetration, tables and graphs, 9: 2472

gamma penetration and dose rates in, from Na^{24}, 9: 6783

heat and free energy of formation, 9: 529(J)

heat transfer during boiling of, 9: 1238(J), 7324(J)

heat transfer to boiling, forced through a uniformly heated tube, 9: 1804

high-temperature, corrosive effects on Al and Al alloys, 9: 6991

high-temperature, stress-corrosive effects of, on austenitic stainless steel and other construction materials, 9: 4782

hydrolysis of alkyl halides and sulfonium salts by, and D_2O, 9: 2646(J)

infrared spectrometric determination of D_2O in, 9: 94(J)

isotopic reactions with HD, 9: 861(J)

Water (cont'd)

mass-spectrometric analysis for oxygen, 9: 6723(J)

maximum heat flux during boiling of, in vertical tubes, 9: 4434(J)

micro analysis for D, vapor-tension method, 9: 2645(J), 3780

molecular structure, theory, 9: 231(R)

neutron attenuation by, 9: 774

neutron attenuation measurements at high energies, 9: 4004(J)

neutron distribution in, from a fast neutron source, 9: 411(J)

neutron flux distribution in, at In resonance energy, 9: 1107

neutron penetration from a point isotropic fission source in, 9: 6039

neutron penetration from point isotropic monoenergetic sources in, 9: 6030

neutron-proton coincidences from γ bombardment, 9: 1066(R)

neutron velocity and spectrum, 9: 7892(J)

proton magnetic resonance in concentrated salt solutions, 9: 5084(J)

penetration and diffusion of γ radiation in, 9: 3677(J)

photo-oxidation of, by ceric ion, mechanism of, 9: 2669

purification of, in reactors by ion exchange, 9: 4570(J)

radiation chemistry, review, 9: 5287

radiation chemistry, elementary processes in, 9: 104(J)

radioinduced decomposition of, yields of H_2O_2, effects of KCl and KBr, 9: 2660(J)

radiolysis of, 9: 5571

reaction with CaH_2, 9: 6189(J)

self-diffusion coefficients of, in aqueous ovalbumin solutions, tracer study, 9: 1229(J)

self-diffusion of, in protein solutions, theory, 9: 1187(J)

separation from steam, efficiency of efferent vertical centrifugal steam separators for, 9: 7741(J)

slowing down of Ra-α-Be neutrons, 9: 1105

softening of, by ion exchange, review, 9: 3106(J)

solubility of air in, instrument for, 9: 3068

solubility of hydrogen in, enrichment of D_2 in, 9: 2405

solution with dioxane, determination of pKd values and stability constants of, 9: 869(J)

temperature effects of positron annihilation in, 9: 6792(J)

thermal neutron diffusion parameters, 9: 1387(J)

thermodynamic functions of, to 12,000°K, 9: 1896

trace amounts, coulometric determination of, in organic solvents, 9: 5259

vapor pressure and separation factor for mixture of D_2O and, 9: 545(J)

vapor pressure lowering of, by addition of NaCl and KCl, 9: 524(J)

Water-d

determination, in liquid samples by a diffusion-equilibration method, 9: 4740(J)

line width parameter of, at low frequencies, 9: 4639

low-frequency rotational spectra, 9: 7961(J)

neutron attenuation measurements at high energies, 9: 4004(J)

production processes, 9: 7155(J)

Water-d_2

determination in liquid samples by a diffusion-equilibration method, 9: 4740(J)

electrolytic dissociation of, electrodes, cells, materials and apparatus for measurement of, 9: 3078(J)

enrichment by fractional distillation, 9: 3785

exchange between clay minerals and, 9: 2648(J)

hydrolysis of alkyl halides and sulfonium salts by, and H_2O, 9: 2646(J)

infrared spectrometric determination in water, 9: 94(J)

microwave spectra, 9: 7966(J)

Water-d_2 (cont'd)
neutron-proton coincidences from γ bombardment, 9: 1066(R)
physical properties of, from room temperature to 250°C, 9: 2181(J)
production, commercial and laboratory-scale, 9: 7302(J)
production of, reaction towers in water electrolysis plants for, calculations, 9: 6950(J)
separation of boric acid from, by ion exchange, 9: 3097
thermochemical properties, at 0° and 27°C, 9: 4394(J)
transport mean free path of thermal neutrons at 13°C, 9: 2476(J)
vapor pressure, 9: 545(J)
vapor pressure and separation factor for mixture of water and, 9: 545(J)
vibration-rotational band ν_1, measurement, 9: 7963(J)

Water-d_2-boric acid systems
separation of boric acid from, by ion exchange, 9: 3097

Water-t
formation and relative abundance in atmosphere, 9: 126(J)

Water-t_2
preparation of a primary standard of, for use in determination of tritium content of water samples, 9: 1697
tissue distribution and toxicology of, in rats and man, 9: 12

Water-acetic acid systems
activity coefficients, 9: 4713(J)

Water boiler neutron sources
critical masses in water boilers, graphical method of obtaining, 9: 6141
production of short-lived isotopes in, 9: 1953(J)

Water-boron oxide-lithium oxide systems
phase studies, 9: 4073(J)

Water-1-butanol systems
mass transfer in a horizontal liquid-liquid extraction tube, properties affecting the film coefficients of, 9: 2208

Water-2-butanone systems
mass transfer in a horizontal liquid-liquid extraction tube, properties affecting the film coefficients of, 9: 2208

Water-butyric acid systems
activity coefficients, 9: 4713(J)

Water-cadmium chloride-zinc chloride systems
activity coefficients at 25°C, 9: 3795(R)

Water-cyclohexanol systems
mass transfer in a horizontal liquid-liquid extraction tube, properties affecting the film coefficients, 9: 2208

Water-deuterium systems
isotopic exchange, effect of γ radiation on, 9: 6222(J)

Water-ethyl ether-uranyl nitrate systems
distribution coefficients in, 9: 7312(J), 7313(J)

Water-1-propanol-toluene systems
solubility diagrams and physical properties, 9: 7272(R)

Water-2-furaldehyde systems
mass transfer in a horizontal liquid-liquid extraction tube, properties affecting the film coefficients of, 9: 2208

Water-hydrogen-oxygen systems
chemical reactions in corrosion loops, kinetics, 9: 6477

Water-hydrogen peroxide systems
thermochemical properties, at 0° and 27°C, 9: 4394(J)

Water-hydrogen sulfide systems
effects of, on electrode potentials and corrosion of Zn, Fe, Al, Ag, Pb, Sn, Ni, Cu, Mg, Avial, steel, and brass, 9: 4143(J)

Water-methane, nitro- systems
mass transfer in a horizontal liquid-liquid extraction tube, properties affecting the film coefficients of, 9: 2208

Water-methanol systems
decomposition of, by Co^{60} gamma radiation, formaldehyde and ethylene glycol yields from, 9: 2203(J)

Water moderated reactors
(See also specific water moderated reactors.)
control rod effectiveness, theory, 9: 4285
design and cost factors of swimming pool type, 9: 751(J)
research, reference material on, 9: 6479

Water-oxygen systems
isotopic exchange reactions (thermal), 9: 6868

Water-propionic acid systems
activity coefficients, 9: 4713(J)

Water purification equipment
effectiveness of ion-exchange materials in removal of chemical warfare agents, 9: 914

Water-silver nitrate-sodium nitrate systems
activity coefficients at 25°C, 9: 3795(R)

Water-sodium chloride systems
corrosion effects, 9: 3459

Water-sodium oxide-uranium(VI) oxide systems
equilibrium phase relations in, 9: 58

Water-steam systems
deposition of salts and temperature distribution in steam-generating pipes, 9: 3449(J)
structure, investigation of, by means of radioisotopes, 9: 7743(J)

Water supplies
concentration of radium and thorium in wells of the Chicago and Frankfurt am Main, Germany, areas, 9: 3231(J)

Water-thorium nitrate systems
heat of solution, 9: 6868

Water-uranyl chromate systems
phase studies and melting point, 9: 3384

Water-uranyl sulfate systems
viscosity of 0.176 to 2.865 molal, from 20 to 90°C, 9: 1490

Water vapor
(See also Steam.)
adsorption isotherms of, on lampblack, 9: 6683(J)
photoionization efficiencies and cross sections in, 9: 6747(J)
reaction of, with Zn, D_2 isotope effects, 9: 73(J)
thermal conductometric determination of low concentrations of, in gases, instrument for, 9: 99

Water-zirconium systems
drying and explosive limits, 9: 1853

Wave mechanics
(See also Mathematics; Physics.)
atomic wave functions, programming for calculation of, 9: 6546(R)
dipole moment matrix elements in π electron systems, 9: 5198(J)
of electrons in final states and bremsstrahlung, 9: 7213(J)
many parameter wave functions in the independent particle model, 9: 1695(J)
nuclear shell, theory, 9: 1640(J)
Schrödinger equation for helium atom, a more accurate solution of, 9: 1419(J)
self mass of photons by, 9: 1143(J)
of spin 0 particles in Hamiltonian form, 9: 7589(J)

Wear
(See also appropriate subheadings under specific materials.)
determination, of machine components, radioisotope techniques, 9: 5943(J)

Welded joints
(See also Welds.)

Welded joints (cont'd)
creep and creep-rupture characteristics of Al alloy and stainless steel, 9: 5356
fatigue behavior in Ti and Ti alloys, 9: 5340(R)
mechanical properties of inert-gas-shielded tungsten-arc fused square butt, 9: 6302(J)
microstructure of Ag-brazed Ti, 9: 7362(J)
Welding
(See also appropriate subheadings under specific materials; see also Brazing; Soldering.)
of 2S aluminum rib assemblies with ultrasonics, 9: 5352
of aluminum sheet by oxy-acetylene process, 9: 221(J)
arc, process adjustment in inter-gas-shielded, 9: 211(J)
argon-arc method, use in British atomic factories, 9: 5975(J)
bibliography on, 9: 5360
condenser impulse, design of equipment, materials, energy considerations, and uses of, 9: 641
cracking, modified techniques to reduce, 9: 4465(J)
cracking in, literature survey, 9: 1532
equipment for, 9: 2737
equipment for, design and performance, 9: 1859
equipment for argon-arc, of stainless steel pipes, 9: 3514, 3515
flash, mathematical analysis of temperature distribution during, 9: 5373(J)
hard-facing alloy steels with electric arcs, control measures in, 9: 220(J)
heat exchanger tubes, procedures, 9: 216(J)
of heat exchangers, procedures, 9: 632
heliarc, design and testing of remotely controlled device for joining stainless steel tubes, 9: 631
heliarc, in N atmosphere, NO_2 formation during, 9: 629
inert-gas, in aircraft industry, 9: 6301(J)
inert-gas, prevention of current rectification and high frequency interference in, 9: 212(J)
of molybdenum, design and performance of equipment for, 9: 974
molybdenum, equipment for, 9: 6661
multi-arc, electrical aspects of, 9: 3167
radioactive process equipment, use of protective clothing, 9: 6670(J)
resistance, electronic controls, 9: 2833(J)
sigma, principles of and suitable power supply for, 9: 210(J)
stainless steel, for 1100°F turbine operation, 9: 5372(J)
techniques for, heavy sections, 9: 222(J)
of 30-ft-diam. steel test tank, 9: 228(J)
of type 347 stainless steels, qualification tests on modified type 347 stainless steel electrodes for, 9: 2734
underwater, manual on, 9: 6331(J)
underwater, operating characteristic of different waterproofing coatings on electrodes, 9: 2316(J)
Welds
of copper–nickel alloy with stainless steel, thermal rupture, 9: 1264
corrosion, strength, thermal cycling of ultrasonic, on 2S aluminum, 9: 5352
crack sensitivity of, in light alloys, effects of separation stresses, form of separation of intermediate phases, shrinkage cavities, and unusual shrinking stresses on, 9: 196
cracking in, and adjacent parent metal, causes, 9: 4804
cracking tests on filler-wire and base-metal compositions of steel, 9: 3494(R)
ductility and microstructure, 9: 5663
effect of current, voltage, and speed travel on, in Cr steels, 9: 218(J)
fatigue of spot-welded joints in Ti, 9: 1849(R)
Welds (cont'd)
fatigue tests of, in Ti alloys, stainless steel, and Al alloy, 9: 3500
gamma radiography, 9: 1819(J)
high-strength filler metals for welding steels, testing, 9: 3497(R)
mechanical properties, effects of interstitial elements on, in α-β Ti alloys, 9: 7005
mechanical properties of, in unalloyed Ti, 9: 215(J)
mechanical properties of multipass, in Zircaloy 2, 9: 5655
in molybdenum, ductility, 9: 633
physical properties of, effects of H, O, N, and C on welds in Ti, 9: 7783
in stainless steel, mechanical properties of, 9: 1860
in stainless steel, testing, 9: 3864
in stainless steel (austenitic) and AMS 6415 low-alloy steel, mechanical properties, 9: 1840
strength and toughness of, in unalloyed Ti, improvement of, 9: 225(J)
radiographic analysis, 9: 1279(J)
strength of, calculation of by an empirically determined limit curve, 9: 217(J)
tensile properties of, in Al alloys, 9: 3506
tensile properties of arc-deposited C steel, effect of temperature on, 9: 223(J)
tensile testing of, in Mg–Zr alloys, 9: 2737
titanium alloy in Ti, mechanical properties and phase structure, 9: 1339
of titanium alloys, fatigue behavior, 9: 3491(R)
titanium and titanium in alloys, fatigue behavior and testing, 9: 1839(R)
in titanium, determination of the effect of alloying elements on the properties of, 9: 5375(J)
in titanium–Mn sheet alloy RC-130A, effects of heat treatment and surface contamination on, 9: 227(J)
titanium spot, tensile properties, 9: 224(J)
West Virginia
occurrence of radioactive coal and shale in northern, 9: 6268
West Willys Claim (Nev.)
uranium distribution and geology, 9: 1260(J)
West Willys Group (Nev.)
exploration, geology, mineralogy, and U distribution, 9: 1516(J)
Wetting
properties of organic liquids on high-energy surfaces, 9: 6596
Wheat
synthesis of albumin in x-irradiated, tracer studies, 9: 5576(J)
White Canyon Area (Utah)
geophysical exploration, 9: 1512
mineralogy, 9: 1829
White Canyon Quadrangle (Utah)
photogeologic map of, 9: 5015(J), 5018(J)
White Oak Creek
ecology and radiobiological monitoring, 9: 1445
White River Badlands (S. Dak.)
exploration, geology, and U distribution, 9: 3158(J)
White River Formation (Wyo.)
geology, 9: 627(J)
Whitewood Limestone (S. Dak.)
geology of, 9: 165(J)
Willaha Area (Ariz.)
exploration, Cu-U occurrence in, mineralogy, 9: 6652
Wilson Prospect (Ark.)
geophysical exploration, 9: 7333
Wind River District (Wyo.)
exploration, 9: 1514(R)

Wind River Formation (Wyo.)
uranium distribution and exploration, 9: 1261(J)

Windows
commercial, relative resistance of different types to blast damage, 9: 6817
shielding glasses and liquids for protective, 9: 2519(J)
thin glass, preparation and properties, 9: 649

Windy Claims (Calif.)
geology, 9: 3837(J)

Wingate Formation (Colo.)
geology of, in Horse Range Mesa Quadrangle, 9: 7775(J)

Wingate Formation (Utah)
stratigraphy of, in Seven Mile Canyon Area, 9: 6964

Wisconsin. Univ., Madison
progress reports on chemistry of Zr and Hf, 9: 6934(R)
progress reports on LiF thermoluminescent dosimeters, 9: 2412(R)

Wood
secondary electrons from, for primary electrons of 20 kev to 1.3 Mev, 9: 5989(J)
transient heat flow in thermally irradiated, analysis, 9: 5314(J)

Woodside Quadrangle (Utah)
photogeologic map of, 9: 3831(J)

Wounds
(See also Trauma.)
healing, effects of total-body irradiation on, in mice, 9: 467(J)

Wray Mesa (Colo.-Utah)
exploration, 9: 1513

Wyoming
exploration of Gas Hills Area in Fremont and Natrona counties, 9: 1261(J)
exploration of Pumpkin Buttes Area in Campbell and Johnson counties, 9: 627
mineral determinations in U deposits and prospects in Albany, Campbell, Carbon, Converse, Fremont, Natrona, Niobrara, counties, 9: 5948(R)

Wyoming (Johnson Co.)
exploration of Mayoworth Area in, 9: 956(J)

Wyoming (Sweetwater Co.)
geochemistry and mineralogy of uraniferous coal deposits in Red Desert Area in, 9: 7337(J)
uranium bearing coal in Red Desert Area in, 9: 2263

Wyoming. Univ., Laramie. Natural Resources Research Inst.
progress reports on lime bonded and stabilized with TiO_2 as a refractory, 9: 945(R)

X

X radiation
(See also Gamma radiation; Photons.)
absolute yield of Fe^{3+} from 200 kv, on $FeSO_4$, 9: 108(J)
absorption curves, derivation and discussion of, 9: 6095
absorption of, by tissue and water, 9: 2038(J)
albumin synthesis effects in wheat, tracer studies, 9: 5576(J)
anemia and blood-platelet changes following total-body exposure to, in rats, 9: 2119(J)
bacteremia following total-body exposure to, relationship to indigenous intestinal flora in rats, 9: 2115(J)
bacteremia in mice following exposure to, 9: 5636
bacteremia induced by exposure to, in mice, 9: 5232(J)
from betatrons, therapeutic applications, 9: 1724(J)
biochemical effects of, on tissues, 9: 2548(R)
biological effectiveness of high and low intensity, on Drosophila, 9: 3029(J)
biological effects of, 9: 6155(R)
biological effects of, compared with effects of α particles, in mice, 9: 2564(J)
biological effects of, compared with effects of α particles on yeast, 9: 3364
biological effects of, on microörganisms and mouse spleen, 9: 1723(R)
biological effects of, on rats, 9: 7239(J)
biological effects of 80-kv, compared with 250 kv, in mice, 9: 3(R)
biological efficiency in producing erythema, 9: 6844(J)
blood histamine level and skin erythema following exposure to single doses, 9: 6570(J)
broad-beam 70- to 250-kvp, attenuation by Al and concrete, 9: 2046(J)
calibration of diagnostic beams, 9: 3374(J)
carcinogenicity of whole-body, in rats, 9: 17
cataract production by, mechanism of, in rabbits, 9: 494(J)
cataracts induced by exposure to, 9: 7245(J)
chromatic error in small-angle scattering analysis of, influence of, on shape of scattering curve, 9: 6786(J)
chromosome aberrations induced by exposure to, effects of fractionated dosage on, in Tradescantia, 9: 4352(J)
chromosome aberrations induced by exposure to, in Drosophila sperm, 9: 7235(J)
chromosome aberrations induced by exposure to, in maize, 9: 7236(J)
chromosome breakage and rejoining capacity following exposure to, in Trillium, 9: 1154
chromosome breakage following exposure to, in Tradescantia, 9: 2576(J)
collimation error produced by experimental arrangement for recording scattered, 9: 6787(J)
comparative effects of 124 kv and 50 Mev, on eggs of Habrobracon, 9: 7634(J)
conductivity induced in polyethylene terephthalate by, 9: 4013(J)
congential malformations from exposure to, a statistical analysis of offspring of radiologists, 9: 3025(J)
correlation of diffraction and transmission experiments, 9: 7169(J)
critical-absorption and emission energies of elements in kev, table, 9: 3227(J)
decomposition of alanine following exposure to, 9: 4402(J)
detection and measurement, 9: 7860(J)
detection and measurement, design and performance of a dose rate-meter, 9: 5438(J)
detection and measurement, design of a condenser dose rate meter for, 9: 5437(J)
detection and measurement, efficiency of standard free-air ionization chambers, 9: 1331(J)
detection and measurement, Soviet Union dosimeters for, 9: 5428(J)
detection and measurement by colorimetric determination of halogen acid released from halogenated hydrocarbon, 9: 5548(P)
detection and measurement of, over a wide band of energies, performance of a photographic film detector, 9: 1318
detection by melamine, 9: 5127(J)
detectors for, absorption and counting efficiency data for, 9: 4524(J)
dosage determinations, 9: 6155(R)
dosage determinations of, application of automatic computing machines in, 9: 6170(J)
dosage determinations in rotation therapy, 9: 6852(J), 6853(J)
dosage determinations of, based on damage to Bacterium coli, 9: 6572(J)
dosage determinations of, for rabbits, 9: 3(R)
dosage determinations of, from continued and fractional exposure in mice, 9: 2555(J)
dosage determinations of, in a convergent beam arc, 9: 6729(J)
dosage determinations of, to walls of radiographic rooms, 9: 2047(J)
dosimetry by alkali halide crystals, 9: 6733(J)
dosimetry of, using photographic film detectors, 9: 2428(J)

X radiation (cont'd)
effects of a single dose of 135 to 285 r of, on blood picture in man, 9: 3012(J)
effects of continuous and periodically interrupted, on grains and rabbits, comparison, 9: 27(J)
effects of cumulative doses of, on learning and retention in monkeys, 9: 2109
effects of divisions of central nervous system, 9: 7614(J)
effects of doses of, between 1,000 and 25,000 r, on guinea pigs, 9: 1168(J)
effects of exposure of radiosensitive organs and tissues to, on development of radiation sickness, 9: 3018(J)
effects of exposure of skin to, on diffusion of fluids, 9: 3742(J)
effects of exposure of skin to, in producing erythema, 9: 1158(J)
effects of high and of minimum doses of, on bone marrow, 9: 5220(J)
effects of high dosage, on success of skin grafting in mice, 9: 2560(J)
effects of local exposure to, on formation of new capillaries in skin following trauma, 9: 2561(J)
effects of maternal exposure to, on developing eyes in rat fetuses, 9: 5575(J)
effects of 180-kev and 31-Mev, on Ehrlich-Ascites carcinoma, of white rats, 9: 7629(J)
effects of spleen shielding during exposure to, on susceptibility to infection in mice, 9: 5581(J)
effects of single and divided doses of, on life span of rats, 9: 5857(J)
effects of total- and of partial-body exposure to, on tissue distribution of Fe in young rats, tracer study, 9: 3050(J)
effects of total-body exposure to, compared with effects of radiomimetic chemicals, 9: 3013(J)
effects of total-body exposure to, compared with effects of exposure to fast neutrons, in dogs, 9: 5213
effects of total-body exposure to, in urinary excretion of desoxyribonucleases in rats, 9: 23(J)
effects of total-body exposure to, on absorption from gastrointestinal tract in rats, tracer study, 9: 5209
effects of total-body exposure to, on acetylation of sulfanilamide in rats and guinea pigs, 9: 3729
effects of total-body exposure to, on adhesiveness of leukocytes, in dogs and guinea pigs, 9: 5228(J)
effects of total-body exposure to, on adrenal cortical activity in rats, 9: 3365
effects of total-body exposure to, on bacteremia in rabbits, 9: 7241(J)
effects of total-body exposure to, on bats, modifications produced by hibernation and starving, 9: 5215(J)
effects of total-body exposure to, on biochemical activity in spleen of rats, 9: 3738(J)
effects of total-body exposure to, on blood sugar levels and liver glycogen levels in rats, 9: 7611
effects of total-body exposure to, on body fluid compartments in human subjects, 9: 3031(J)
effects of total-body exposure to, on carboxypeptidase inhibitor in mice, rats, and rabbits, 9: 3728
effects of total-body exposure to, on cholinesterase activity in mice, 9: 7633(J)
effects of total-body exposure to, on concentrations of oxidized and reduced diphosphopyridine nucleotide in rat liver, 9: 3740(J)
effects of total-body, on content of mercapto groups in tissues, 9: 6829(J)
effects of total-body exposure to, on developing sperm, in mice, 9: 5217(J)
effects of total-body exposure to, on desoxyribonuclease activity of spleen in rats, 9: 488(J)
effects of total-body exposure to, on enzyme activity in hematopoietic tissue, in mice and rats, 9: 14
effects of total-body exposure to, on enzyme systems of liver and spleen in rats, 9: 2120(J)
effects of total-body exposure to, on erythrocytes in rats, 9: 6579(J)

X radiation (cont'd)
effects of total-body exposure to, on erythropoiesis in dogs and rats, 9: 3739(J)
effects of total-body exposure to, on functional activity of coenzyme A, 9: 2574(J)
effects of total-body exposure to, on glycogen metabolism in rats, 9: 7233
effects of total-body exposure to, on healing of wounds in mice, 9: 48[illegible]
effects of total-body exposure to, on hematopoietic system, in rats, 9: 5580(J)
effects of total-body exposure to, on intestinal epithelium in mice, 9: 5229(J)
effects of total-body exposure to, on intestinal flora in rats, 9: 6161(J)
effects of total-body exposure to, on lipoprotein metabolism in rabbits, 9: 1446
effects of total-body exposure to, on lipoprotein metabolism in rabbits, dogs, rats, and mice, 9: 3009
effects of total-body exposure to, on liver mass in rats, 9: 1447
effects of total-body exposure to, on memory of monkeys, 9: 478, 479
effects of total-body exposure to, on metabolism and on adenosine triphosphatase and 6-nucleotidase activity of hematopoietic system in rats, 9: 480(R)
effects of total-body exposure to, on metabolism of benzoic acid in rats, 9: 486(J)
effects of total-body exposure to, on metabolism of sulfanilamide and phenolic compounds by guinea pigs and rats, 9: 480(R)
effects of total-body exposure to, on nitrogen excretion in rats, 9: 2568(J)
effects of total-body exposure to, on nucleic acid, nitrogen, and water content of Yoshida sarcoma, 9: 7246(J)
effects of total-body exposure to, on nucleic acid levels and other biochemical constituents in rat tissue, 9: 480(R)
effects of total-body exposure to, on organ weights in mice, 9: 4676(J)
effects of total-body exposure to, on phospholipid synthesis and lipid distribution in rats, 9: 1161(J)
effects of total-body exposure to, on pyrophosphatase and adenosinetriphosphatase activity of spleen and thymus in rats and renal function in chickens, 9: 3(R)
effects of total-body exposure to, on response to analgesic drugs, in rats, 9: 13
effects of total-body exposure to, on spleen desoxyribonuclease in rats, 9: 7242(J)
effects of total-body exposure to, on spleen weight in mice, 9: 7240(J)
effects of total-body exposure to, on synthesis of liver proteins, tracer study, 9: 7234
effects of total-body exposure to, on thymus weight in mice, 9: 4677(J)
effects of total-body exposure to, on uptake of iron by duck erythrocytes, 9: 1155, 2580(J), 5230(J)
effects of total-body exposure to, on weight of mice, 9: 477
effects of varied doses of, on chromosomes in Tradescantia, 9: 3000(J)
effects on barley seed and effects of storage conditions, 9: 7632(J)
effects on adenosine triphosphatase activity in tissue homogenates, 9: 2587(J)
effects on aqueous protein solutions, 9: 6612(J)
effects on aqueous solutions of glycine, 9: 5918(J)
effects on aqueous solutions of nucleic acids and some nucleotides, 9: 5615(J)
effects on atrophy of small intestine, 9: 1711
effects on barley seed, 9: 3369(J)
effects on blood picture, modifications produced by hypophysectomy on, in rats, 9: 7641(J)
effects on capillary fragility, in frogs, 9: 5231(J)
effects on cell division in amoeba, 9: 2112(J)
effects on central nervous system, a literature survey on, 9: 7635(J)

X radiation (cont'd)
effects on central nervous system from local exposure to, 9: 2588(J)
effects on chromosomal aberrations and rejoining in Trillium, 9: 476
effects on chromosome aberrations in Datura, compared with effects of fast and thermal neutrons, 9: 5233(J)
effects on chromosomes in tomato plants, 9: 1451(J)
effects on chromosomes of Vicia, 9: 6160(J)
effects on chromosomes in grasshopper neuroblasts, 9: 2575(J)
effects on chromosomes in Drosophila, 9: 3021(J), 3023(J)
effects on conduction velocity of isolated nerves in bullfrogs, 9: 3727
effects on cytoplasm of Habrobracon eggs, 9: 2573(J)
effects on desoxyribonuclease activity of blood plasma in rats, 9: 2579(J)
effects on developing embryos of rainbow trout, 9: 5844(J)
effects on developing snail embryos, 9: 5845(J)
effects on development of eggs of Habrobracon, 9: 3024(J)
effects on development of embryos of frogs, 9: 620
effects on division rate and survival of Tillina and Colpoda, 9: 2584
effects on Drosophila bristles, 9: 2585(J)
effects on E. coli, influence of low temperature on recovery, 9: 2562(J)
effects on electric conductivity of mica, 9: 4620(J)
effects on electrolyte retention in muscle, 9: 3032(J)
effects on enzyme activities, weight, and respiration of hematopoietic tissues, 9: 4665
effects on eyes of mice fetuses, 9: 6838(J)
effects on eyes of rabbits, 9: 6839(J)
effects on fertility of mice and viability of their progeny, 9: 7613(J)
effects on growth and histochemistry of adrenal autotransplants in rats, 9: 22(J)
effects on growth of tissue cultures, compared with effects of electrons, 9: 3016(J)
effects on haploid parent cells of S. cerevisiae, 9: 5216(J)
effects on hatchability of haploid and diploid embryos of Habrobracon, 9: 5577(J)
effects on hemin formation in laboratory animals, tracer study, 9: 4914(J)
effects on hypophysectomized rats, 9: 684 (J)
effects on hypothalamus in primates, 9: 633(J)
effects on immunity to tetanus toxoid in mice, 9: 4668
effects on incorporation of adenine into nucl ic acids in mice, 9: 1449(J)
effects on incorporation of formate into nucleic acid components in rats, tracer study, 9: 1176
effects on incorporation of P into desoxyribonucleic acid in mice, tracer study, 9: 5848(J)
effects on infectivity and hemagglutination properties of influenza virus, 9: 2106
effects on intact spinal cord on monkeys, 9: 4354(J)
effects on Fe uptake by red blood cells, in rats, 9: 1711
effects on Fe uptake by bone-marrow cells, tracer study, 9: 3011(J)
effects on kidney function, 9: 6837(J)
effects on lipoprotein metabolism in dogs, 9: 5573
effects on lipoprotein metabolism in rabbits, 9: 5839
effects on Mg level in blood serum, 9: 5223(J)
effects on metabolism in chick embryos, tracer study, 9: 3376
effects on metabolism in eggs and embryos of grasshoppers, 9: 495(J)
effects on mitotic activity in Xenopus larvae, 9: 6576(J)
effects on metabolism of radioactive glutathione in mice, 9: 15

X radiation (cont'd)
effects on motility and morphology of human sperm, 9: 5224(J)
effects on nucleic acid content of carcinoma cell suspensions, 9: 1718(J)
effects on nucleic acid content of thymic cells in mice, 9: 2558(J)
effects on nucleic acid metabolism in chick embryos, 9: 4691
effects on ovaries of mice, 9: 2557(J)
effects on Paramecium, 9: 3014(J)
effects on phagocytosis and bactericidal power of blood, 9: 2577(J), 2578(J)
effects on plasma amino acids levels in developing chick embryos, and oxidative phosphorylation in mitochondria of bat brains, 9: 6820(J)
effects on production of pituitary tumors in mice, 9: 6835(J)
effects on properties of amino acids and proteins, 9: 4403(J)
effects on reaction between formic acid and cerium(IV) ions in aqueous solution, 9: 3792(J)
effects on recovery from oxygen poisoning, in rats, 9: 5579(J)
effects on regeneration of tail tip in Xenopus larvae, 9: 6577(J)
effects on resorption rate of injected $NaHCO_3$ in rats, tracer study, 9: 3732(J)
effects on reticulo-endothelial function in rats, tracer study, 9: 6574(J)
effects on seed, influence of sea-water content on, 9: 483(J)
effects on serum protein in rats having a benzopyrene-induced tumor, 9: 31(J)
effects on skin epithelium of tadpole tails, 9: 6842(J)
effects on Na-K exchange in erythrocytes, 9: 5222(J)
effects on solutions and complexes of proteins, 9: 7616(J)
effects on solutions of protein, cystine, and thymonucleic acid, 9: 5291(J)
effects on sterol metabolism in yeasts, 9: 1170(J)
effects on sugar content of barley seeds, 9: 4915(J)
effects on survival and cleavage in Ascaris eggs, influence of temperature, 9: 2571(J)
effects on tissue distribution of polyvinylpyrrolidone in rabbits, 9: 5838
effects on tolerance to anesthetic agents, in rats, 9: 6826
effects on velocity of conduction in isolated nerves of frogs and rabbits, 9: 2582(J)
effects on viscosity of alginates, 9: 2658(J)
escape peak correction of iodine K, for NaI crystals, 9: 312(J)
from a four-million-volt Van de Graaff accelerator, radiographic characteristics, 9: 1368
genetic and non-genetic effects of, on Neurospora, 9: 475
genetic effects of, compared with effects of fast neutrons in Drosophila, 9: 824(J)
genetic effects of, in Drosophila, 9: 30(J)
genetic effects of, in fungi, 9: 29(J)
hematological effects of, modifications produced by parabiosis in rats, 9: 4351(J)
high-energy, integral dose measurement in betatron radiation therapy, 9: 2878(J)
high-intensity, measurement of, 9: 1604(J)
inactivation of chymotrypsin by exposure to, 9: 7438(J)
inactivation of yeast by exposure to, effects of hydrostatic pressure on, 9: 1167(J)
induced exchange of Ce(III)–Ce(IV) in aqueous HNO_3 and H_2SO_4 acids by, 9: 2668(J)
induced sterility in Habrobracon from, effects of delayed oviposition on, 9: 3736(J)
induction of chromosome aberrations by, analysis of, 9: 3027(J)
induction of emesis by total-body exposure to, in dogs, 9: 16
induction of mutations following exposure to, effects of wave-length on, in Drosophila, 9: 3731

X radiation (cont'd)
induction of recessive lethals in mature sperm of Mormoniella following exposure to, 9: 5846(J)
ionization current ratios of, instrument for measuring, 9: 2419(J)
lethal dosage, determinations of, administered to the head of mice, 9: 6836(J)
lethal effects, mechanism of, 9: 18
lethal effects, modifications by tissue homogenates and chemicals in mice and rats, 9: 2595(J)
lethal effects of, effect of partial shielding on, in mice, 9: 4357
lethal effects of, influence of fractionation of dose on, in rats, 9: 4666
lethal effects of, on E. coli, influence of irradiation conditions, 9: 4917(J)
lethal effects on rats, 9: 1711
low-angle diffraction, theory and applications, 9: 6349(J)
low-energy depth-dosage determinations, 9: 2547(R)
mechanism of the photographic action of, 9: 7828(J)
melanotic tumor and erupt eye production by, in Drosophila, 9: 3022(J)
mesic, proportional counter detection of, 9: 7870(J)
mitotic effects of, on cells of Vicia, effect of pretreatment with maleic hydrazide, 9: 4922(J)
mutations in Escherichia coli produced by, effect of temperature on, 9: 6832(J)
oxidation and reduction of ceric salts by, 9: 1215(J)
oxidation and reduction of cerous-ceric system by, role of oxygen radicals in, 9: 1214(J)
oxygen effect in exposures of bacteria and yeast to, role of respiration and cellular metabolism in, 9: 24(J)
pathological effects and lethal dosage determination of, for chick embryos, 9: 822(J)
pathological effects of, determined by blood plasma levels of injected I^{131} in rats, 9: 6824
pathological effects of, on developing teeth in rats, 9: 484(J)
pathological effects of, on gonads of mice, 9: 2554(J)
pathological effects of, on mice, compared with effects of γ radiation from atomic explosions, 9: 6825
pathological effects of, on nerve cells in brain of primates, 9: 831(J)
pathological effects of, on newborn mice, 9: 2556(J)
pathological effects of, on laboratory animals, 9: 4911(R)
pathological effects of total-body exposure to, effects of diet on, in rats, 9: 2569(J)
pathological effects of total-body exposure to, on kidneys in chickens, 9: 3(R)
photonuclear reactions with Cu, Zn, Ga, Ge, and As, interpretation of results, 9: 3654(J)
photonuclear reactions with Cu, Zn, Ga, Ge, and As, yields from, 9: 3653(J)
physiological and histochemical effects of total-body exposure to, in connective tissue in rats, 9: 492(J)
physiological effects of, as demonstrated by effects on growth and mutations in barley, 9: 1159(J)
physiological effects of, on tissue cultures of Ehrlich tumor cells, 9: 5570
physiological effects of total-body exposure to, in mice and rats, 9: 6154(R)
from π-mesonic atoms, K-series, 9: 7082(J)
from π-mesonic atoms, Z = 6 to 26, 9: 7083(J)
plant growth effects, temperature and atmosphere influences, 9: 6164(J)
probability distribution of intensities in molecules, 9: 2494(J)
production by β excitation, 9: 2950
protective action of cysteine and 2-aminoethanethiol against, 9: 4358
protective effects of thiourea and thyroxine against exposure to, in mice, 9: 3034(J)
radiolysis of hydrocarbons by exposure to, 9: 7309(J)

X radiation (cont'd)
in radiotherapy of malignant epibulbar melanoma, 9: 5244(J)
relative biological effectiveness of, in mammalian systems, compared with effects of other radiations, 9: 3007
scattering, connected with theories of fluids, 9: 6097(J)
sensitivity of dormant and germinating barley seed to, 9: 5853(J)
sensitivity of pertussis-vaccinated mice to, 9: 4670(J)
small angle scattering by surface irregularities, 9: 3675(J)
spatial distribution of energy dissipation by high-energy, calculation, 9: 422(J)
spray, effects on survival times of patients with chronic leukemia, 9: 3037(J)
sterilization of food by soft, 9: 6821
synergistic effects of total-body exposure to, with blast effects on mice, 9: 3744(J)
therapy, skin cancer following, 9: 32(J)
therapy of skin tumors with, effects of inhalation of oxygen, 9: 2124(J)
therapy with, changes in blood picture during, 9: 3038(J)
thrombocytopenic purpura following exposure to, 9: 6571(J)
tolerance to anoxia following total-body exposure to, in guinea pigs, 9: 2110
toxin production following exposure to, in rats, 9: 2099(R)
transmission of, through human body, 9: 3039(J)
tumors following exposure to, in mice, 9: 827(J)
wave numbers of Kα satellites in, from Z = 19 to 42, 9: 4341(J)
from 2-Mev Van de Graaff accelerator, dosage determination and therapeutic applications, 9: 7253(R)

X-ray beams
high-energy, dosimetry, 9: 2879(J)
pulsed, measurement of distortion in magnet cloud chambers with, 9: 3596(J)
spectral dose rate distribution of, from a Be window tube operated at 50 kvp, 9: 2334

X-ray cameras
accessories, for use in photography of Po^{210} samples, 9: 5096
design, for diffraction studies at low temperatures, 9: 2835(J)

X-ray-diffraction analysis
broadening of line profiles in, method for correcting, 9: 5389(J)
of compounds and solid solutions of perovskite-like structures, 9: 6382(J)
design and construction of a total-reflection diffraction camera for, 9: 6349(J)
design and performance of a tungsten-coil furnace for high-temperature of phase changes and equilibria, 9: 2319(J)
effect of cold-work distortion on, 9: 6914(J)
equipment for, of metals under controlled stress at elevated temperature, 9: 277(J)
equipment for, performance, 9: 3408
focusing camera for, 9: 4227
of liquids at high temperatures, up to 1600°C, chamber for, 9: 7435
with plane glass grating, determination of elements, 9: 4905(J)
of radioactive samples, 9: 4525(J)
scintillation counting applied to, 9: 313(J)
of single crystals, spot width variations in, 9: 6348
temperature-diffuse scattering from powder patterns, correction for, 9: 5086
textbook on, 9: 1931(J)
wave length for highest angle in, nomographs for determination of, 9: 7836(J)

X-ray diffractometers
design and performance, 9: 1309(J)
for radioactive materials, design, 9: 5710(J)

X-ray equipment
automatic exposure controller for roentgenographic examination, design, 9: 1456

X-ray equipment (cont'd)
compact demountable diffraction tube and associated equipment, design, 9: 2389(J)
design of gas-target tubes, 9: 1133
portable field, design and performance, 9: 2826
wavelength of peak intensity of x-ray tubes, measurement, 9: 5694(J)
X-ray monochromators
bent-crystal, for Geiger counter diffractometry, 9: 5709(J)
X-ray sources
(See also Gamma sources.)
beta-ray excited low energy, 9: 3333(J)
preparation from β-excited nuclides, 9: 2950
wavelength of peak intensity of x-ray tubes, measurement, 9: 5694(J)
X-ray spectra
(See also appropriate subheadings under specific elements and isotopes.)
determination from absorption curves, 9: 6095
emission, of Eu, Gd, Tb, Ho, Tm, 9: 6129(J)
of heavy elements, measurement and calculation of intensities, 9: 5190(J)
isotope shift in, of heavy elements, 9: 1414
X-ray spectrometers
adapter for, for study of large single crystals, design and performance, 9: 2831
adjustable bilateral slit for use with photomultiplier in, 9: 2398(J)
computation of the absorption peak location in, 9: 5707(J)
curved-crystal, design and measurements, 9: 5190(J)
curved-crystal, microanalysis and simultaneous analysis by, applications in, 9: 3435(J)
design of cylindrical, 9: 4501(J)
double-crystal, relation between x-ray line and resolving power, 9: 686(J)
fluorescent, counting geometry, 9: 4514
fluorescent, design and performance, 9: 5706(J)
high-temperature furnace for use with, 9: 4822
performance, in measurements of electron energy distribution, 9: 6418(J)
photographic and Geiger-counter techniques, comparison, 9: 1945
resolving power of bent-crystal, 9: 285(J)
single crystal temperature-controlled oven for, 9: 1028(J)
small-angle, design and performance, 9: 800(R)
X-ray spectroscopy
by electron bombardment, advantages for determination of elements, 9: 4905(J)
radiation hazards, 9: 5235(J)
rare earth determination by x-ray fluorescence, 9: 6541
Xanthates
solubility in water at 25°C, 9: 4980
solubility products, 9: 623(R), 3111(R)
Xenon
ionization yields, 9: 999(J)
solubility and diffusion in Bi(l), theory, 9: 6177
virial coefficients, crystal properties, and heat of sublimation at 0°K, 9: 7843(J)
virial coefficients, from 0° to 700°C, 9: 3573(J)
x-ray absorption, 9: 4524(J)
Xenon isotopes
fission yield of, in neutron fission of U^{235} and U^{238}, 9: 7601(J)
nuclear properties, 9: 735
Xenon isotopes Xe^{125}
nuclear properties, 9: 735
Xenon isotopes Xe^{127}
decay scheme, 9: 2968(J)
Xenon isotopes Xe^{127} (cont'd)
nuclear properties, 9: 735
Xenon isotopes Xe^{129}
use of, in determination of time interval between formation of the elements and of meteorites, 9: 6339(J)
Xenon isotopes Xe^{131}
gamma emission from, intensity relationship of, 9: 1684
Xenon isotopes Xe^{135}
decay schemes, measurements and interpretation, 9: 3332(J)
removal from reactor solutions by stripping, 9: 7921
Xenon isotopes Xe^{138}
decay schemes, measurements and interpretation, 9: 3332(J)

Y

Yeasts
biosynthesis of ergosterol in, effects of ionizing radiations on, 9: 7620(J)
effects of ultraviolet radiation on, effect of dose fractionation on, 9: 6565
growth and cell division of, chemical inhibition, 9: 1461(J)
metabolism of electrolytes by, effects of cell surface, tracer study, 9: 4092
metabolic rate in bacteria of, studied by C^{14}, 9: 7662(J)
oxygen effect in x-irradiated, role of respiration and cellular metabolism in, 9: 24(J)
radioinduced lethal damage in S. cerevisiae, 9: 5216(J)
radiosensitivity of, effects of maleic and malonic acids on, 9: 6166(J)
radiosensitivity of, effects of redox substances on, 9: 6581(J)
radiosensitivity of S.cerevisiae, effects of Synkavite on, 9: 5336(J)
reproduction of, effects of physical and chemical environment and exposure to x radiation, 9: 1712
sterol metabolism in x-irradiated, 9: 1170(J)
x-ray inactivation of, effects of hydrostatic pressure on, 9: 1167(J)
Yellow Cat Area (Utah)
stratigraphy, 9: 2262(R)
Yentna Region (Alaska)
exploration of, 9: 5650(J)
Yerington Property (Nev.)
exploration, 9: 1260(J)
Yip Yip Mine (Colo.)
uranium and V distribution, 9: 1513
Ytterbium
chelation with thenoyltrifluoroacetone, 9: 924(J)
hyperfine structure, 9: 2525(J)
separation from rare earths by ion exchange, 9: 5889(J)
spectrographic determination of, in Er, 9: 5272(J)
tissue distribution of, in rats, tracer study, 9: 2551(R)
Ytterbium chlorides
crystal structure, 9: 544(J)
heat of reaction of $YbCl_2$ with HCl, 9: 5295(J)
Ytterbium isotopes Yb^{175}
decay, 9: 4626(J)
gamma emission, 9: 2136(R)
radioactivity, 9: 4274(J)
Ytterbium isotopes Yb^{177}
decay, 9: 4626(J)
Ytterbium oxide–uranium oxide systems
crystal structure and physical properties, 9: 7316(J)
phase studies, 9: 7678(J)

Yttrium
determination by Cu-spark spectroscopy, 9: 885(J)
metabolism and tissue distribution, tracer study, 9: 6176(J)
polarographic studies, 9: 5602(J)
radiochemical determination, 9: 876, 2634
radiocolloidal properties at tracer concentrations, 9: 4965(J)
separation from the rare earths by a chromate process, 9: 6616(J)
spectrographic determination of, in Dy, Ho, and Er, 9: 5272(J)
spectrographic determination of, in ores and rocks, 9: 162
spectrum of, in 9400 to 11,500 A region, 9: 2988(J)
tissue distribution of, effect of chelates on, following injection to rats and rabbits, tracer study, 9: 4693(J)
tissue distribution of, following intracavitary administration to normal and tumor-bearing mice and cancer patients, tracer study, 9: 511(J)
tissue distribution of, in experimental animals, tracer study, 9: 1725(J)

Yttrium chlorides
crystal structure, 9: 544(J)
tissue distribution and excretion of, after intraprostatic injection in dogs, tracer study, 9: 3378(J)

Yttrium complexes
with cupferron, pyrolysis, 9: 5920(J)

Yttrium compounds
with cyclopentadiene, 9: 3096(J)

Yttrium isotopes Y^{86}
gamma spectra and half life, 9: 734

Yttrium isotopes Y^{88}
gamma spectrum and decay scheme of, 9: 1669

Yttrium isotopes Y^{88}
decay schemes and half lives, 9: 61(R)
isomeric state of, in decay of Zr^{88}, 9: 3684(J)

Yttrium isotopes Y^{89}
deuteron reactions (d,p), proton angular distributions from, 9: 762(J)

Yttrium isotopes Y^{91}
beta sources of, for medical applications, 9: 7253(R)
colloids of, preparation and tissue distribution in animals, 9: 1459(J)
design and fabrication of radiation sources containing, 9: 7060
distributed in rubber beads, β radiation dosage determinations, 9: 6587(J)
forbidden β transition of, internal bremsstrahlung and atomic ionization accompanying, 9: 6535(J)
gamma emission, 9: 1407(J)
half life, 9: 2004(J), 2399
half life determination, 9: 7115(J)
K and L x rays following autoionization, measurement of, 9: 6534(J)
metabolism of, by rats and rabbits, effects of chelates, 9: 4693(J)
preparation of carrier-free, 9: 2399
radiography using x radiation produced by, 9: 4679
in radiotherapy of tumors, 9: 5243(J)
therapeutic uses, 9: 7253(R)
thermal neutron fission yields from U^{235}, 9: 817
uniform clay spheres, manufacture, 9: 2099(R)

Yttrium isotopes Y^{91}
decay, 9: 4324(J)
thermal neutron fission yields from U^{235}, 9: 817

Yttrium isotopes Y^{92}
decay schemes and half lives, 9: 2948

Yttrium minerals
distribution of, in Ariz., Canada, Ceylon, Colo., Va., Finland, India, N. Mex., Sweden, Texas, and Union of South Africa (Cape Province), 9: 7335

Yttrium nitrates
preparation of anhydrous, by reaction of oxides and NO_2, 9: 112(J)
solvent partition of, between nitric acid and tributyl phosphate, 9: 901

Yttrium oxide–thorium oxide systems
phase studies, fluorite phase in ThO_2–Y_2O_3, 9: 7276(J)

Yttrium oxide–uranium oxide systems
oxidation of, phase diagrams, 9: 1796(J)
phase studies, 9: 4486(J)

Yttrium oxide–zirconium oxide systems
fluorspar phase occurrence and lattice defects in, 9: 7298(J)

Yttrium oxides
separation and preparation by ion exchange, 9: 1788(J)

Z

Zeolites
(See Anion exchange materials; Cation exchange materials; Ion exchange materials.)

ZEPHYR
design, power-level measurement, shielding and operational safety, core assembly, and delayed neutrons and kinetics, 9: 753(J)
neutron flux variation with number of fuel elements present, 9: 2445
operational features of, 9: 1083(J)

Zinc
adsorption of O_2 on evaporated films of, 9: 2159(J)
bremsstrahlung reactions at 320 Mev, interpretation of results, 9: 3654(J)
bremsstrahlung reactions at 320 Mev, nuclide yields from, 9: 3653(J)
corrosion of, and stainless steel–Zn couples by water, inhibition with Na dichromate-chloramine mixtures, 9: 153
creep and hardness of, effects of impurities and imperfections on, 9: 970
cross sections for neutron transmission and multiplication, 9: 3646(J)
determination in Al alloys, 9: 5886
differential neutron elastic scattering cross sections at 4.1 Mev, 9: 4597(J)
diffusion in ZnO crystals under a Zn atmosphere, 9: 5252(J)
diffusion of, in Ag single crystals in temperature range 640 to 925°C, 9: 7001(R)
diffusion of, in Ag–Zn alloys with admixtures of Au, Ga, Sn, Sb, Al, and In, 9: 3875
diffusion of, in α and β-brasses, 9: 7008(J)
electroforming from fluoborate, sulfate–chloride, chloride, and cyanide baths, 9: 3495
electrolytic deposition of, effect of fluorine in, 9: 891(J)
galling and seizing of, by friction coefficients, 9: 1269
gamma reactions (γ,n), 9: 1358(J)
ion exchange on Dowex 50 at 25°C, 9: 3795(R)
liquid-liquid extraction from Co, 9: 1224(J)
μ-meson capture by, transition probability for, in terms of electric charge distribution, 9: 1068(J)
neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)
pore formation and dimensional changes during diffusion, effects of grain boundaries on, 9: 4817(J)
pressure-compression data for, from shock wave measurements, 9: 3876(J)
quantitative determination of divalent, using a high-frequency oscillator and ethylenediaminetetraacetic acid, 9: 2169(J)
radiometric determination, 9: 2634
reaction of, with water vapor, D_2 isotope effects, 9: 73(J)

Zinc (cont'd)
solid-solubility curve of, in Cd, 9: 2770(J)
spectrographic determination in Bi, 9: 1475
surface diffusion, coefficients of, 9: 3845(R)
thermodynamic properties of, in Al–Zn alloy, 9: 972(R)
wetting by liquid Na, 9: 229(J)
whisker growth by vapor deposition on glass, 9: 7816(J)
x-ray spectra (soft), 9: 452(J)

Zinc (liquid)
vapor pressure from 554 to 904.2°C, 9: 1883(J)

Zinc alloys
corrosion testing, methods for cleaning exposed specimens for, 9: 952(J)
room- and elevated-temperature mechanical properties and heat treatment, 9: 3840(R)

Zinc–aluminum alloys
corrosion of, in 95°C, low-conductivity, aerated, distilled water, 9: 2725
creep, activation energies for, 9: 5961
creep, intercrystalline fracture, and grain structure, 9: 4456
creep of, grain-boundary movement, slip, and fragmentation during, 9: 2321(J)
intercrystalline grains in, growth of, determined by the method of microhardness, 9: 642(J)
oxidation and corrosion, effects of alloying elements on, 9: 7011(J)
quenching effects of, with reference to elastic properties, 9: 6320(J)
thermodynamic properties, 9: 972(R)

Zinc–aluminum–copper alloys
fatigue testing in different stress ranges, 9: 5061
spiral substructures in β phase, 9: 1881(J), 1882(J)

Zinc–aluminum–magnesium alloys
precipitation, textural phenomena occurring during, 9: 6315(J)
stress corrosion of, due to $MgZn_2$, 9: 4143(J)

Zinc–aluminum–silicon systems
corrosion of, in 95°C, low-conductivity, aerated, distilled water, 9: 2725

Zinc–beryllium–cobalt–copper alloys
mechanical properties, 9: 3509

Zinc—calcium alloys
crystal structure, 9: 683(J)

Zinc chelates
with 2,4-pentanedione, formation constants, enthalpy, and entropy, 9: 3390(J)

Zinc chloride–cadmium chloride–water systems
activity coefficients at 25°C, 9: 3795(R)

Zinc chromites
heat capacities, 9: 5077

Zinc coatings
spraying of, on iron and steel for corrosion prevention, 9: 3150(J)
on steel, corrosion and weldability of, 9: 171

Zinc complexes
with o-phenanthroline and sulfonated oxine, electrodeposition from aqueous solutions of, electronic configuration in, 9: 2625(J)

Zinc–copper alloys
diffusion coefficients for, 9: 5348(R)
relaxation effects in solid solutions of, arising from changes in local order, 9: 204(J)
relaxation strength, 9: 1537(J)

Zinc crystals
cleaved, photoelectric work function, 9: 4266(R)
yield strength, effects of structure of dislocation boundaries on, 9: 183

Zinc ferrates(III)
heat capacities, 9: 5077

Zinc fluorides
crystal structure, 9: 92(J)

Zinc(II) ions
thermodynamic formation constants in aqueous solution for reaction of, with acetylacetonate at 30°C, 9: 1191(J)

Zinc isotopes
electromagnetic concentration of stable, 9: 1312
Szilard-Chalmers concentration, 9: 1959(J)

Zinc isotopes Zn^{65}
capture-positron branching ratios, 9: 1674(J)
determination of, in animal tissues, 9: 3379(J)
gamma emission, energy measurement by secondary electron absorption, 9: 809(J)
selective uptake of, by dorsolateral prostate of rats, 9: 4662(J)
toxicology of, for cattle, 9: 1156(R)

Zinc isotopes Zn^{67}
Coulomb excitation functions and energy levels for, bombarded with 3.5-Mev α particles, 9: 423(J)

Zinc isotopes Zn^{68}
deuteron reactions (d,p), 9: 1397(J)

Zinc isotopes Zn^{69}
disintegration, 9: 2972(J)
energy levels, 9: 1397(J)

Zinc isotopes Zn^{71}
disintegration, 9: 2972(J)

Zinc–lanthanum alloys
crystal structure, 9: 683(J)

Zinc–lithium–magnesium alloys
phase relations in, 9: 3166

Zinc minerals
adsorption of thiols on, 9: 166(J)

Zinc oxides
electrical conductivity of, dependence on the presence of foreign oxides, 9: 4369(J)
heat and free energy of formation, 9: 529(J)

Zinc–silver alloys
diffusion of Zn in, with admixtures of Au, Ga, Sn, Sb, Al, and In, 9: 3875

Zinc sulfide crystals
properties, 9: 6444(R)
silver activated, decay of luminescence of, after excitation by α particles and electrons, 9: 4405(J)

Zinc sulfides
doubly activated phosphors of, effects of infrared radiation on, 9: 431(J)
fluorescence, mechanism of, 9: 6003(J)
fluorescence and phosphorescence of, and ZnS:CdS phosphors, influence of alternating electric fields on, 9: 7075(J)
luminescent centers in Cu- and Cl-activated, 9: 7885(J)
manganese-activated, excitation and magnetic susceptibility, 9: 7072(J)
neutron detection with thin scintillators of, 9: 7880(J)
photoluminescent modulation in nonuniformly excited phosphor powders, 9: 7887(J)
scintillation by α particles, 9: 3600(J)
specific heat, 9: 6212(J)

Zinc–tin alloys
corrosion of, in 95°C, low-conductivity, aerated, distilled water, 9: 2725

Zinc–tin–aluminum alloys
corrosion of, in 95°C, low-conductivity, aerated, distilled water, 9: 2725

Zinc–titanium alloys

heat capacities and entropies at 298.16°K, 9: 4374(J)

heat content of, up to 1798°K, 9: 4375(J)

Zippeites

occurrence in Delta deposit (Utah), 9: 4998

Zircaloy

(See Tin–zirconium alloys.)

Zirconium

amperometric titration of, in presence of fluoride ion, 9: 540(J)

aqueous and anhydrous chemistry, 9: 6934(R)

books, 9: 209(J)

chemical analysis, review, 9: 4200(J)

chemical polishing, 9: 7990(P)

colorimetric determination of, with alizarin, 9: 6201(J)

combustion in air and O_2, 9: 3498(R)

commercial production, development, 9: 7817(J)

and its compounds, toxicity, physiological effects, and therapeutic uses, bibliography, 9: 6171

corrosion by Bi–Pb–Sn alloy at elevated temperatures, 9: 6659

corrosion in water and aqueous media at 600 and 680°F, 9: 1822

corrosion of, anodizing as a means of evaluating, 9: 5646

corrosion resistance in 680°F water, effect of heat treatment on, 9: 7331

coupled to Al alloys, galvanic corrosion in H_2SO_4 solutions, 9: 3151(J)

creep and preferred orientation, 9: 5058(R)

deformation processes in, 9: 4819(J)

determination in Mg alloys using p-bromo- and p-chloromandelic acid, 9: 4731(J)

determination in mixtures with Th, Fe, and Ti, by use of 2,4-dichlorophenoxyacetic acid, 9: 2841(J)

determination of trace amounts of rare earths in, 9: 5890(J)

differential neutron elastic scattering cross sections at 4.1 Mev, 9: 4597(J)

diffusion of H_2 and D_2 in, 9: 344(J)

dissolution of, in acids, 9: 2783(J)

effect of injected, on tissue distribution of Pu in rats, 9: 3(R)

elastic properties and internal friction, variations with temperature, 9: 7345

electrodeposition in non-aqueous solutions, 9: 6291

electrodeposition of, from aqueous, nonaqueous, and fused-salt electrolytes, 9: 1895

enamel coatings, composition and application, 9: 4792

fabrication of cans for SRE core, 9: 5502(J)

friction testing of halogenated hydrocarbon lubricated, 9: 961(R)

gravimetric determination of, in Nb–U ternary alloys, 9: 4074

gravimetric determination of, with p-chloromandelic acid, 9: 4074

grinding, for production of Zr powder, 9: 1853

heat capacities, 9: 5077

heat transfer coefficients of, in liquid NaK and Na, 9: 1254

ingots, preparation by sidewall fusion, 9: 7344

light produced by combustion of, in O_2, analysis of, 9: 1894(J)

mass transfer and corrosion by liquid NaK and Na and microstructure, 9: 1254

metallurgy, book on, 9: 7798(J)

melting, consumable electrode arc, 9: 6660

melting of, for conversion of sponge to corrosion-resistant ingot, 9: 7343

metallurgy of, in nuclear energy, 9: 7376(J)

neutron inelastic collision cross sections at 1.0, 4.0, and 4.5 Mev, 9: 2443(J)

neutron reactions (n,α), differential cross section for, 9: 6078(J)

Zirconium (cont'd)

neutron reactions (n,α) and (n,p), cross section for, 9: 6077(J)

neutron reactions (n,nγ) at 4.5 Mev, γ rays from, 9: 4589(J)

neutron reactions (n,nγ), γ yields and energies from, 9: 4204(R)

oxidation of, under conditions of linear temperature increase, 9: 182

photometric determination of, in aluminum alloys, 9: 3545(J)

polarographic determination in aqueous solution, 9: 2099(R), 7289

potentiometric analysis of, for small amounts of U, 9: 4725

preferred orientation, 9: 190(R)

preferred orientation of β-annealed, 9: 189

preparation, properties, and industrial uses, review, 9: 7371(J)

preparation by bomb reduction of Zr compounds, 9: 169

production, modifications in the Kroll process, 9: 5968(J)

production by caustic leaching of zircon sand, 9: 586

production by Kroll process, 9: 5319(J)

production of, by caustic soda fusion of Zr ores, 9: 1259(J)

production of, from K_2ZrF_6 in an electrolyte of fused NaCl, 9: 3201(J)

properties and reactor applications, 9: 6476

radiochemical determination, 9: 876, 2634

rate of solution of Hf-free, in HF solutions, 9: 3144

ratio of Hf to, in minerals and rocks, 9: 1522(J)

reaction of N with and diffusion of N in, at high temperatures, 9: 2145(J)

reclamation of contaminated chips for arc-melting feed stock, 9: 4489(J)

scaling, effect of oxide or nitride layers on, in air at elevated temperatures, 9: 7754

scaling in N_2 and air at elevated temperatures, 9: 967(R)

scaling of, at elevated temperatures, 9: 4994

scaling of arc-melted iodide, in air, O_2, N_2, and mixtures of O_2 and N_2 from 600 to 1300°C, 9: 3458(R)

self-diffusion, tracer study, 9: 630

separation from Al by ion exchange, 9: 4754

solubility and decomposition pressures of H in, 9: 1877(J)

sonic inspection of arc-cast, 9: 4167

spectrographic determination of, in ores and rocks, 9: 162

spectrophotometric determination, 9: 4074

spectroscopic analysis for Hf, 9: 3074(J)

spectroscopic determination, 9: 4084(J)

surface area changes and corrosion rate of, measurement, 9: 3143

surfaces, cleaning and electrodeposition on, 9: 7991(P)

tensile properties of, within a range from room temperature to 600°F, 9: 6284

tensile properties of arc-melted, from −195 to 500°C, 9: 3179

tensile properties of cold-reduced crystal-bar, at 300°C, 9: 3180(R)

thermal conductivity, 9: 4266(R)

thermal expansion properties, 9: 4792

thermal oxidation of, influence of anodic oxide films on, 9: 203(J)

toxicity and diagnostic and therapeutic uses, 9: 845(J)

turbidimetric microdetermination of, 9: 88(J)

volumetric determination of, in the presence of Nb, 9: 7702(J)

volumetric determination with EDTA, 9: 7699(J)

Zirconium (liquid)

chemical reactions in water, 9: 4175(R), 5657(R)

chemical reactions with steam, 9: 6999(R)

Zirconium alloys

corrosion, 9: 7155(J)

extrusion of Zircaloy 1 by Ugine-Sejournet glass process, 9: 3742

gravimetric analysis for Nb or Ta, 9: 5274(J)

Zirconium alloys (cont'd)
history of, in foundries in the U. S., 9: 7372(J)
metallography, microstructure, and preparation of, 9: 7003
production of, by consumable electrode arc melting, 9: 3533(J), 6660
properties and reactor applications, 9: 6476
room- and elevated-temperature mechanical properties and heat treatment, 9: 3840(R)
sonic inspection of arc-cast, 9: 4167
Zirconium–aluminum alloys
as container material for Ti, evaluation, 9: 4780
creep-rupture, 9: 190(R)
creep-rupture at elevated temperatures, 9: 2727(R)
crystal structure and properties of, 9: 2762(J)
electrodeposition, 9: 6291
metallurgical properties, survey, 9: 3822(J)
spectrographic determination of Al in, 9: 6195
Zirconium–aluminum couples
solid state bonding, tensile properties, and intermetallic penetration, 9: 6303(J)
Zirconium–aluminum–nickel alloys
preparation, density, resistivity, stress-rupture, and transverse rupture strength of hot-pressed, 9: 3165(R)
Zirconium–aluminum–titanium alloys
hardness, crystal structure, and phase studies, 9: 3520
impact testing, presintering and sintering and stress-rupture testing of sintered, 9: 3850(R)
Zirconium borides
metallurgical properties, survey, 9: 3822(J)
powder metallurgy and refractory properties, 9: 4440(J)
preparation by vacuum technique, 9: 1821(J)
production of, from Zr oxide and boron carbide, 9: 6258(J)
properties of, effect of molten Ti on, 9: 2248
reactions with C and N_2, equilibria studies, 9: 5677(J)
Zirconium borohydrides
preparation and electrolysis in non-aqueous solutions, 9: 6291
Zirconium–boron systems
size of interstitial solute atoms, lattice expansion, and electronic properties of close-packed, 9: 1780(J)
Zirconium carbides
properties of, effect of molten Ti on, 9: 2247
Zirconium–carbon–silicon systems
phase diagrams, 9: 4704
Zirconium chloride addition compounds
with acetonitrile and isoamyl ether, phase studies, 9: 6931
with $POCl_3$, preparation and structure, 9: 5910
Zirconium chloride complexes
with phosphorus pentachloride, $ZrCl_4$ recovery from, 9: 1425(P)
Zirconium chlorides
bomb reduction of, to prepare Zr, 9: 169
preparation and analysis, 9: 169
preparation and crystal properties of $ZrCl_4$, 9: 6932
production from zircon sands by the Kroll method, 9: 6309(J)
recovery of, from complex compounds of $ZrCl_4$ and PCl_5, 9: 1425(P)
reduction of, for production of Zr powder, 9: 1853
solvolysis in CH_3OH and C_2H_5OH, 9: 4967
Zirconium–chromium alloys
creep-rupture, 9: 190(R)
preferred orientation of cold-rolled and cold-rolled and annealed, 9: 3180(R)
preparation and fabrication, 9: 3179
Zirconium–chromium alloys (cont'd)
tensile properties of, from −195 to 500°C, 9: 3179, 3180(R)
Zirconium complexes
with alizarin S, polarographic behavior and absorption spectra, 9: 6933
Zirconium compounds
organo-, chemistry, review, 9: 6893(J)
polarographic behavior of, in molten ammonium formate, 9: 7292
production by caustic leaching of zircon sand, 9: 586
toxicity and diagnostic and therapeutic uses, 9: 845(J)
Zirconium couples
addition compounds with diethyl phthalate, preparation and properties, 9: 72(J)
Zirconium fluoride–sodium fluoride systems
decomposition potentials, 9: 7279(J)
Zirconium fluoride–sodium fluoride–zirconium oxide systems
decomposition potentials, 9: 7279(J)
Zirconium fluorides
bomb reduction of, to prepare Zr, 9: 169
preparation and analysis, 9: 169
vapor pressure, 9: 548(J)
Zirconium–germanium alloys
phase studies and constitution diagrams, 9: 5956
Zirconium iodates
composition of, precipitated from solution containing KIO_3, 9: 70(J)
Zirconium–iron alloys
corrosion resistance in 680°F water, effect of heat treatment on, 9: 7331
creep rupture, 9: 190(R)
tensile properties of particle-strengthened, 9: 7353
Zirconium isotopes Zr^{86}
electron spectra, 9: 4705(R)
gamma spectrum and decay scheme of, 9: 1669
Zirconium isotopes Zr^{88}
decay of, isomeric state of Y^{88} in, 9: 3684(J)
decay schemes, 9: 61(R)
electron spectra, 9: 4705(R)
Zirconium isotopes Zr^{90}
decay schemes, 9: 735
first excited state, predicted 0 + level for, 9: 5491(J), 5492(J)
neutron reactions (n,α), cross section for, 9: 6076(J)
photoneutron cross sections, 9: 5481(J)
Zirconium isotopes Zr^{91}
photoneutron cross sections, 9: 5481(J)
Zirconium isotopes Zr^{94}
neutron reactions (n,α), cross section for, 9: 6076(J)
Zirconium isotopes Zr^{95}
decay scheme, literature survey, 9: 2068(J)
Zirconium isotopes Zr^{97}
gamma emission, 9: 1407(J)
Zirconium–magnesium alloys
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)
tungsten-argon arc welding of, 9: 2737
Zirconium–magnesium–rare earth alloys
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)
Zirconium–magnesium–thorium alloys
preparation, annealing, and electron-diffraction analyses, 9: 4160(R)
Zirconium–molybdenum alloys
as container material for Ti, evaluation, 9: 4780
creep-rupture, 9: 190(R)

Zirconium–molybdenum alloys (cont'd)
fabrication, 9: 1530(R)
fabrication and tensile properties of, from −195 to 500°C, 9: 3180(R)
Zirconium–molybdenum–tin alloys
specifications and properties, 9: 5556(P)
Zirconium–nickel alloys
corrosion resistance in 680°F water, effect of heat treatment on, 9: 7331
Zirconium–niobium alloys
fabrication and phase studies, 9: 1530(R)
preferred orientation of β-annealed, 9: 189
tensile properties, 9: 5058(R)
Zirconium nitrides
vaporization and heat of formation of, 9: 2153(J)
Zirconium–nitrogen systems
size of interstitial solute atoms, lattice expansion, and electronic properties of close-packed, 9: 1780(J)
Zirconium ores
caustic soda fusion of, for production of Zr, 9: 1259(J)
x-ray spectrographic analysis for Hf, 9: 3073(J)
Zirconium oxide–calcium oxide systems
fluorite phase in, 9: 6886(J)
phase studies, 9: 4781(J)
Zirconium oxide crucibles
preparation and properties of, for molten Ti, 9: 2246
Zirconium oxide–lanthanum oxide systems
heat treatment and phase studies, 9: 3141(J)
Zirconium oxide–magnesium oxide systems
phase studies, 9: 4781(J)
Zirconium oxide–neodymium oxide systems
heat treatment, phase studies, and thermal expansion, 9: 3141(J)
Zirconium oxide–silicon oxide–sodium oxide systems
physical and chemical properties and crystallography of phases in, 9: 2138(J)
Zirconium oxide–sodium fluoride–zirconium fluoride systems
decomposition potentials, 9: 7279(J)
Zirconium oxide–titanium systems
hardness and microstructure, 9: 2246
powder metallurgy, 9: 3496
Zirconium oxide–uranium oxide systems
x-ray diffraction patterns, 9: 127
Zirconium oxide–yttrium oxide systems
fluorspar phase occurrence and lattice defects in, 9: 7298(J)
Zirconium oxides
band spectra of ZrO, 9: 3798(J)
combined with oxides of V, Cr, Mo, W, and Mn, preparation and fluorite structures of, 9: 857(J)
formation of $Ce_2O_3 \cdot 2ZrO_2$ in system $BaCl_2$–$CeCl_3$–$BaZrO_3$, 9: 4408(J)
heat and free energy of formation, 9: 529(J)
high purity, preparation, 9: 868(J)
isotopic equilibration determination of O in, 9: 3394
preparation and analysis, 9: 169
production, cost factors, and uses of zirconia, 9: 151(J)
properties of, effect of molten Ti on, 9: 2246
reaction of Th with, at high temperatures, 9: 1247
rotational analysis of the x and γ systems of, 9: 1228(J)
x-ray-diffraction analysis using high-temperature furnace, 9: 4822
Zirconium–oxygen–phosphorus systems
metallic phases in, 9: 858(J)
Zirconium–oxygen systems
chemical properties, hardness, phase studies, and preparation, 9: 628
isotopic equilibration analysis for O, 9: 3394
size of interstitial solute atoms, lattice expansion, and electronic properties of close-packed, 9: 1780(J)
Zirconium powders
combustion of, at atmospheric pressures, 9: 57(R)
production of, by reduction of Zr chloride and grinding, 9: 1853
resistance sintering under pressure, 9: 1878(J)
Zirconium silicides
crystal structure of ZrSi and $ZrSi_2$, 9: 1010(J)
reactions with C and N_2 at 2000°K, 9: 4704
Zirconium–silicon systems
as container material for Ti, evaluation, 9: 4780
Zirconium sulfides
x-ray studies of, 9: 887(J)
Zirconium–tantalum alloys
fabrication and phase studies, 9: 1530
preferred orientation, 9: 190(R)
tensile properties, 9: 5058(R)
Zirconium–tin alloys
corrosion in water and aqueous media at 600 and 680°F, 9: 1822
fabrication, 9: 1530
high-temperature oxidation, 9: 5678(J)
multipass welds, embrittlement of, 9: 5655
preparation, fabrication, and effect of heat treatment on mechanical properties and grain size, 9: 966
volumetric determination of Sn in, 9: 6868
Zirconium–titanium alloys
fabrication, 9: 1530(R)
hot-rolled textures of, 9: 1836(R)
Zirconium–titanium couples
diffusion of Zr in, tracer study, 9: 630
Zirconium–uranium alloys
explosive properties of, during dissolution, etching, and pickling in nitric acid and HCl–ethyl acetate solutions, 9: 127
microstructure, phase studies, and x-ray diffraction patterns, 9: 127
phase studies, 9: 3354(J)
thermal conductivity at 70°C, 9: 1879(J)
Zirconium–water systems
drying and explosive limits, 9: 1853
Zircons
caustic leaching, 9: 586
radiation effects on specific gravity, unit-cell dimensions, and optical properties, 9: 6107(J)
spectrophotometric analysis for Th, 9: 4945
Zirconyl chlorides
ignition of, to prepare ZrO_2, 9: 169
preparation, purification, and analysis, 9: 169
ZOE Reactor
nonlinear kinetics, 9: 3979(J)
Zuni Uplift (N. Mex.)
geophysical exploration, 9: 2709

NUMERICAL INDEX OF REPORTS

Numerical Index of Official Atomic Energy Reports with Indications of Their Availability.

The Numerical Index of Reports is divided into two parts: Part I—all AEC reports abstracted or listed in *NSA* Vol. 9 (1955), together with those AEC reports which were published in the open literature and consequently unavailable in report form; Part II—non-AEC reports, which should not be requested from the Technical Information Extension.

For each reference the number preceding the dash is the volume number, and the numbers following are the abstract numbers.

In addition to the report number and corresponding abstract number, the index includes a brief statement regarding the availability of each AEC report listed; no special efforts were made to determine the availability of non-AEC items, but such information is included when known. For further information regarding the availability of these reports, consult the Introduction to this index.

Nuclear Science Abstracts, Vol. 7, No. 24A, Dec. 31, 1953, includes a cumulated Numerical Index of Reports covering all reports in *Abstracts of Declassified Documents (ADD)* and in *NSA*, Vols. 1–7, together with the latest availability information as of Dec. 31, 1953. Information concerning reports abstracted in *NSA*, Vol. 8, appears in *NSA*, Vol. 8, No. 24A, Dec. 31, 1954. A completely cumulated listing covering all volumes of *ADD* and *NSA* through Vol. 8 is issued as a separate publication, TID-4000. Each issue of *NSA*, Vol. 9 (1955) and Vol. 10 (1956), contains information concerning reports abstracted in that issue. All current information is cumulated for the first half of the year in issue No. 12B, and a complete annual cumulation is published as issue No. 24A. In addition, each issue contains new information concerning the availability of reports previously abstracted.

In order to help identify the originator of each series of non-AEC reports, a significant word has been placed in parentheses beside the code. No parenthetical word is shown for series of reports issued by the USAEC. Information regarding the location and acquisition of non-AEC reports appears in the Introduction to this issue.

The Introduction to this issue also contains location and acquisition information to supplement the following explanations of the various types of entries found in the "Availability" column:

NSA
Nuclear Science Abstracts.

ADD
Abstracts of Declassified Documents, the predecessor of NSA.

NNES
National Nuclear Energy Series, published by the McGraw-Hill Book Co.

Sale Price (OTS)
USAEC report, available from the Office of Technical Services.

Sale Price (GPO)
USAEC or other report for sale through the U. S. Government Printing Office.

Sale Price (ph OTS or mf OTS)
Available from the Office of Technical Services, Department of Commerce, Washington 25, D. C., in photostat (ph) or microfilm (mf) form.

Sale Price
If British report, available from British Information Services. If Canadian report, available from Atomic Energy of Canada Ltd.

In.....
Reports contained in published books.

Reference (Condensed)
Thesis published in condensed form.

Dep.
USAEC reports available at the All Depository Libraries as full-size copy for consultation or for sale as photocopies.

Dep.(mc)
USAEC reports available at the All Depository Libraries only in microcard form. Full-size copies of such reports can be obtained on a loan basis by any All Depository Library on request to the Technical Information Extension.

JCL
On deposit at the SLA Translation Pool. For information concerning the price of photocopies, inquire of the following address: John Crerar Library, Chicago 1, Illinois, Attn.: SLA Translation Pool.

LC
On deposit at the Scientific Translation Center. For information concerning the price of photocopies, inquire of the following address: Library of Congress, Washington 25, D. C. Attn.: Scientific Translation Center.

Dep.(mc); Ind. Dep.
A report held by the other All Depository Libraries in microcard form only is available in full-size copies at the Industrial Depository Libraries.

Journal (without citation)
Report has been submitted to the journal for publication.

Journal (with specific citation)
Report has been published as cited.

USGS
Available from the U. S. Geological Survey, Washington 25, D. C.

NRC
Available from National Research Council of Canada, Ottawa, Ontario, Canada.

JENER
Available from the Librarian, Joint Establishment for Nuclear Energy Research, Kjeller per Lillerstrom, Norway.

ASSIGNED CODE DESIGNATIONS

MDDC
To declassified reports released by the Manhattan Engineer District and by the Atomic Energy Commission before March 1, 1948.

AECD
To declassified reports released by the Atomic Energy Commission after February 29, 1948 (appeared in April 15, *Nuclear Science Abstracts*).

AECU
To unclassified reports originating within the Atomic Energy Project. (Subsequent to AECU-871, this code is applied only to reports carrying no other recognized code designation.)

NP
A file designation assigned by the Technical Information Extension (TIE) to nonproject reports whose codes, if present, are not practical for TIE use.

Other code designations are assigned to unclassified reports by the originating installations.

Report

A

569

1113

1363

3351

4130

ACCO

10

64

68

ACRH

2

3

AEC-tr

367

794

979

1289

1321

1459

1953

1961

1962

1963

1964

1965

1966

1967

1968

1969

1970

1971

1972

1973

1974

1975

1976

1977

1978

1979

NUMERICAL INDEX OF REPORTS FOR VOLUME 9

AEC REPORTS

Report	Abstract	Availability
A		
509	9-7316	Dep.(mc)
1113	9-7342	Dep.(mc)
1263	9-7317	Dep.(mc)
3351	9-7325	Dep.(mc)
4130	9-6941	Dep.(mc)
ACCO		
16	9-159	Dep.(mc)
64	9-6619	Dep.(mc)
68	9-6865	Dep.(mc)
ACRH		
2	9-3748	Dep.
3	9-7253	Dep.
AEC-tr		
367	9-1930	See TT-167
704	9-1376	See BNL-L-62(p159-62)
979	9-915	See TT-237
1289	9-1748	See TT-300
1321	9-1556	Henry Brutcher (Trans. No. 2769), Altadena, Calif.
1459	9-886	See TT-343
1953	9-3307	JCL
1961	9-236	JCL
1962	9-275	LC
1963	9-193	Henry Brutcher (Trans. No. 3231) Altadena, Calif.
1964	9-194	Henry Brutcher (Trans. No. 3083), Altadena, Calif.
1965	9-156	JCL
1966	9-1258	JCL
1967	9-63	LC
1968	9-64	LC
1969	9-522	JCL
1970	9-80	Associated Technical Services (Trans. 19F4C) East Orange, N. J.
1971	9-195	Henry Brutcher (Trans. No. 3240), Altadena, Calif.
1972	9-1284	LC
1973	9-640	Henry Brutcher (Trans. No. 3405), Altadena, Calif.
1974	9-435	JCL
1975	9-471	LC
1976	9-535	Associated Technical Services (Trans. No. 29F4C), East Orange, N. J.
1977	9-536	Associated Technical Services (Trans. No. 31F4C), East Orange, N. J.
1978	9-523	Associated Technical Services (Trans. No. 32F4C), East Orange, N. J.
1979	9-1158	JCL
AEC-tr		
1980	9-855	JCL
1981	9-862	Associated Technical Services (Trans. 33F4C), East Orange, N. J.
1982	9-891	JCL
1983	9-917	JCL
1984	9-856	LC
1985	9-883	JCL
1986	9-818	JCL
1987	9-902	JCL
1988	9-1214	JCL
1989	9-1215	JCL
1990	9-1184	JCL
1991	9-1216	JCL
1992	9-1063	JCL
1993	9-1765	JCL
1994	9-1793	JCL
1995	9-1865	Henry Brutcher (Trans. No. 3281), Altadena, Calif.
1996	9-1768	LC
1997	9-1706	JCL
1998	9-1866	Henry Brutcher (Trans. No. 3414), Altadena, Calif.
1999	9-1867	Henry Brutcher (Trans. No. 2907), Altadena, Calif.
2000	9-1809	LC
2058	9-2003	Associated Technical Services, East Orange, N. J.
2059	9-1747	Associated Technical Services (Trans. No. 76F4F), East Orange, N. J.
2060	9-1810	LC
2061	9-1794	JCL
2062	9-1795	JCL
2063	9-1811	JCL
2064	9-1947	JCL
2065	9-1796	JCL
2066	9-2230	JCL
2067	9-1940	Associated Technical Services (Trans. No. 85F4G) East Orange, N. J.
2068	9-2138	JCL
2069	9-2139	JCL
2070	9-2475	Associated Technical Services (Trans. 83F4G), East Orange, N. J.
2071	9-2476	JCL
2072	9-2477	Associated Technical Services (Trans. 84F4G), East Orange, N. J.
2073	9-2504	JCL
2074	9-2140	JCL
2075	9-2387	JCL
2076	9-2388	JCL
2077	9-2358	JCL
2078	9-2389	JCL
2079	9-2743	LC
2080	9-2953	JCL

Report AEC-tr	Abstract	Availability
2081	9-2616	LC
2082	9-2680	JCL
2083	9-2744	JCL
2084	9-2796	LC
2086	9-3296	JCL
2087	9-2617	Associated Technical Services (Trans.
2088	9-3045	JCL
2089	9-3184	JCL
2091	9-3078	Associated Technical Services (Trans.
2093	9-3056	JCL
2094	9-3127	
2095	9-3147	
2096	9-3128	
2097	9-3148	
2098	9-3217	
2099	9-3155	Henry Brutcher (Trans. No. 3474), Altadena, Calif.
2100	9-3711	Henry Brutcher (Trans. No. 3475), Altadena, Calif.
2101	9-3387	JCL
2102	9-3388	JCL
2103	9-3447	JCL
2105	9-3525	LC
2106	9-3911	JCL
2107	9-3668	Associated Technical Services (Trans. 19G5G), East Orange, N. J.
2108	9-3731	LC
2109	9-3905	
2110	9-3908	JCL
2111	9-3762	LC
2112	9-4015	JCL
2113	9-3784	LC
2114	9-3780	LC
2115	9-3874	LC
2116	9-3763	Associated Technical Services (Trans. 14G5J), East Orange, N. J.
2117	9-3764	Associated Technical Services (Trans. 16G5J), East Orange, N. J.
2118	9-3765	Associated Technical Service (Trans. 15G5J), East Orange, N. J.
2119	9-3996	Associated Technical Services (Trans. 35G5G), East Orange, N. J.
2120	9-4189	JCL
2121	9-4346	JCL
2122	9-4213	Associated Technical Services (Trans. 49G5G), East Orange, N. J.
2123	9-4248	LC
2124	9-4224	Associated Technical Services (Trans. 48G5G), East Orange, N. J.
2125	9-4585	LC
2126	9-4571	LC
2127	9-4287	LC
2128	9-4190	JCL
2129	9-4687	LC
2131	9-4708	LC
2132	9-4925	JCL
2133	9-4772	JCL
2134	9-4823	JCL
2135	9-4411	
2136	9-4737	Morris D. Friedman (Trans. No. D193575), West Concord, Mass.
2137	9-4835	Morris D. Friedman (Trans. No. D193580), West Concord, Mass.
2138	9-4836	Morris D. Friedman (Trans. No. 193559), West Concord, Mass.
2139	9-4837	Morris D. Friedman (Trans. No. D193583), West Concord, Mass.
2140	9-4906	Morris D. Friedman (Trans. No. D193588), West Concord, Mass.
2141	9-4838	Morris D. Friedman (Trans. No. D193560), West Concord, Mass.
2142	9-4931	JCL
2143	9-4932	LC
2144	9-4755	JCL
2145	9-5093	LC
2146	9-4811	
2147	9-4727	JCL
2148	9-4749	JCL
2149	9-5067	LC
2150	9-5195	
2151	9-4955	
2153	9-5081	LC
2154	9-5082	LC
2155	9-4839	Associated Technical Services (Trans. No. 64G5R), East Orange, N. J.
2157	9-5068	JCL
2158	9-5362	LC
2159	9-5384	LC
2160	9-5094	JCL
2161	9-5083	Associated Technical Services (Trans. No. 65G5R), East Orange, N. J.
2162	9-5541	JCL
2163	9-5504	JCL
2164	9-5092	
2165	9-4985	Associated Technical Services (Trans. 81G5G), East Orange, N. J.
2166	9-5305	LC
2167	9-5385	JCL
2168	9-5292	
2169	9-5293	
2170	9-5294	
2171	9-5251	JCL
2172	9-5421	
2173	9-5428	
2174	9-5405	JCL
2175	9-5312	LC
2176	9-5282	
2177	9-5682	LC
2178	9-5511	
2179	9-5451	LC
2180	9-5619	
2181	9-5620	
2182	9-5591	LC
2183	9-5778	LC
2184	9-5945	LC
2185	9-6426	LC

Report AEC-tr	Abstract	Availability
2186	9-5949	LC
2187	9-5924	LC
2188	9-5911	JCL
2189	9-6294	JCL
2190	9-6256	LC
2191	9-6011	LC
2192	9-5965	JCL
2193	9-6130	JCL
2194(p.A1-2)	9-6355	Columbia Technical Translations, White Plains, N. Y.
2194(p.B1-3)	9-6356	Columbia Technical Translations, White Plains, N. Y.
2194(p.C1-2)	9-6357	Columbia Technical Translations, White Plains, N. Y.
2194(p.D1-2)	9-6358	Columbia Technical Translations, White Plains, N. Y.
2194(p.E1-2)	9-6544	Columbia Technical Translations, White Plains, N. Y.
2194(p.G1-2)	9-6359	Columbia Technical Translations, White Plains, N. Y.
2194(p.H1-4)	9-6360	Columbia Technical Translations, White Plains, N. Y.
2195	9-6391	JCL
2196	9-6512	LC
2197	9-6189	JCL
2198	9-6693	Associated Technical Services (Trans. 52G6R), East Orange, N. J.
2199	9-6694	Associated Technical Services (Trans 28G6R), East Orange, N. J.
2200	9-6809	Associated Technical Services (Trans. 31G6R), East Orange, N. J.
2201	9-6702	Associated Technical Services (Trans. 33G6R), East Orange, N. J.
2202	9-6680	Associated Technical Services (Trans. 32G6R), East Orange, N. J.
2203	9-6810	Associated Technical Services (Trans. 30G6R), East Orange, N. J.
2204	9-6722	LC
2205	9-6769	LC
2206	9-6736	LC
2207	9-6757	LC
2208	9-6681	Associated Technical Services (Trans. 56G-6Ra-b), East Orange, N. J.
2209	9-6785	Associated Technical Services (Trans. 57G6R), East Orange, N. J.
2210	9-6682	Associated Technical Services (Trans. 91G6R), East Orange, N. J.
2211	9-6954	JCL
2212	9-7108	LC
2213	9-7094	LC
2214	9-6912	LC
2215	9-7187	LC
2217	9-7006	LC
2218	9-7048	Columbia Technical Translations, White Plains, N. Y.
2219	9-7045	Associated Technical Services (Trans. RJ-237), East Orange, N. J.
2220	9-7049	Associated Technical Services (Trans. 95G6R), East Orange, N. J.
2221	9-7029	Associated Technical Services (Trans. 99G6R), East Orange, N. J.
2222	9-7030	Columbia Technical Translations, White Plains, N. Y.
2223	9-6883	JCL
2224	9-6884	JCL
2225	9-6959	JCL
2226	9-6885	JCL
2227	9-6943	Associated Technical Services (Trans. 76G6G), East Orange, N. J.
2228	9-6886	Associated Technical Services (Trans. 83G6G), East Orange, N. J.
2229	9-7298	Associated Technical Services (Trans. 82G6G), East Orange, N. J.
2231	9-7359	JCL
2233	9-7360	JCL
2234	9-7394	JCL
2235	9-7470	LC
2236	9-7361	LC
2237	9-7276	Associated Technical Services (Trans. 80G6G), East Orange, N. J.
2238	9-7277	Associated Technical Services (Trans. 73G6G), East Orange, N. J.
2239	9-7318	Associated Technical Services (Trans. 77G6G), East Orange, N. J.
2240	9-7319	Associated Technical Services (Trans. 78G6G), East Orange, N. J.
2241	9-7421	Associated Technical Services (Trans. 54G6R), East Orange, N. J.
2242	9-7422	Associated Technical Services (Trans. 90G6R), East Orange, N. J.
2243	9-7562	LC
2244	9-7395	LC
2245	9-7563	LC
2246	9-7396	Associated Technical Services (Trans. 81G6G), East Orange, N. J.
2247	9-7278	Associated Technical Services (Trans. 74G6G), East Orange, N. J.
2248	9-7397	Associated Technical Services (Trans. 00G7R), East Orange, N. J.
2249	9-7398	LC
2250	9-7279	LC
2251	9-7677	JCL
2252	9-7732	LC
2253	9-7423	JCL
2255	9-7968	LC
2256	9-7950	LC
2257	9-7881	LC
2258	9-7322	Associated Technical Services (Trans. 13G7R), East Orange, N. J.

Report	Abstract	Availability
AEC-tr		
2259	9-7791	JCL
2261	9-7792	LC
2262	9-7793	LC
2263	9-7794	LC
2264	9-7634	LC
2265	9-7795	LC
2269	9-7729	Associated Technical Services (Trans. 15G7J), East Orange, N. J.
2270	9-7969	LC
2271	9-7882	LC
2272	9-7740	Associated Technical Services (Trans. 96G6R),
2280	9-7837	Associated Technical Services (Trans. 58G6R), East Orange, N. J.
2281	9-7678	Associated Technical Services (Trans. 79G6G), East Orange, N. J.
2282	9-7679	Associated Technical Services (Trans. 75G6G), East Orange, N. J.
AECD		
3639	9-987	Dep.(mc)
3640	9-169	Dep.; $0.35
3641	9-2837	Dep.; $0.25
3642	9-2404	Dep.; $0.25
3643	9-6817	Dep.; $0.45
3645	9-6474	Dep.; $4.25 (GPO)
3646	9-6475	Dep.; $5.50 (GPO)
3647	9-6476	Dep.; $3.50 (GPO)
3652	9-4896	Dep.
3654	9-7257	Dep.
3657	9-4653	Dep.(mc)
3658	9-7919	Dep.; $0.30
3659	9-7920	Dep.; $0.25
3660	9-5347	Dep.(mc)
3667	9-7147	Dep.; $0.45
3676	9-7343	Dep.(mc)
AECU		
2779	9-966	Dep.
2918	8-6083	J. Electrochem. Soc. 102, 502-11(1955)
2938	9-50	J. Phys. Chem. 58, 805-11(1954); Dep.(mc)
2942	9-292	Dep.(mc)
2944	9-293	Dep.(mc)
2945	9-9	Dep.
2948	9-138	Dep.(mc)
2949	9-1693	Dep.(mc)
2950	9-936	Dep.(mc) $0.60
2951	9-10	Dep.(mc)
2952	9-11	Dep.
2953	9-532	J. Opt. Soc. Amer. 45, 552-5(1955)
2954	9-152	J. Electrochem. Soc. 102, 420-9(1955)
2955	9-143	Non-Destructive Testing 13, No. 3, 23-6(1955)
2956	9-2470	Phys. Rev. 98, 28-39(1955); Dep.; $0.45
2957	9-474	Dep.(mc)

Report	Abstract	Availability
AECU		
2958	9-734	Dep.(mc)
2959	9-512	Dep.(mc)
2960	9-4741	Dep.(mc)
2961	9-546	Dep.(mc)
2962	9-547	Dep.(mc)
2963	9-1133	Dep.(mc)
2964	9-648	Phys. Rev. 98, 857-70(1955)
2965	9-513	Anal. Chem. 27, 1440-3(1955)
2966	9-649	Rev. Sci. Instr. 26, 562-3(1955)
2967	9-2589	Dep.; $0.20
2968	9-514	J. Am. Chem. Soc. 77, 2113-14(1955)
2969	9-1017	Dep.(mc)
2970	9-848	Dep.(mc)
2971	9-849	Dep.(mc)
2972	9-934	Dep.(mc)
2973	9-1066	Dep.(mc)
2974	9-850	Dep.(mc)
2975	9-2026	Phys. Rev. 98, 466-70(1955)
2976	9-967	Dep.(mc); Ind. Dep.
2977	9-2546	Dep.
2978	9-1181	Dep.(mc)
2980	9-1580	Dep.(mc)
2981	9-1550	Dep.
2982	9-1597	Dep.(mc)
2983	9-1962	Dep.(mc)
2984	9-1963	Dep.(mc)
2985	9-2106	Dep.(mc)
2986	9-2107	Dep.(mc)
2987	9-2108	Dep.(mc)
2988	9-7727	Dep.; $0.10
2989	9-2207	Dep.
2990	9-2330	Dep.(mc)
2991	9-2331	Dep.(mc)
2992	9-2251	Dep.(mc)
2993	9-2723	Dep.(mc)
2994	9-6243	Dep.; $0.70
2995	9-3660	Dep.
2996	9-1863	Dep.(mc)
2997	9-3442	Dep.(mc)
2998	9-2989	Dep.(mc)
2999	9-2990	Dep.(mc)
3000	9-3143	Dep.
3001	9-3210	Dep.(mc)
3002	9-3144	Dep.(mc)
3003	9-7738	Dep.; $0.55
3004	9-2948	Superseded by Phys. Rev. 99, 760-4(1955)
3005	9-3211	Dep.(mc)
3006	9-3251	Dep.(mc)
3007	9-3381	Dep.(mc)
3008	9-3574	Dep.(mc)
3009	9-3575	Dep.(mc)
3010	9-3576	Dep.(mc)
3011	9-3816	Dep.(mc)
3012	9-6584	Dep.; $0.40
3013	9-3458	Dep.(mc); Ind. Dep.
3014	9-3751	Dep.(mc)
3015	9-3995	Dep.(mc)
3016	9-3722	Dep.(mc)
3017	9-3723	Dep.(mc)
3018	9-3724	Dep.(mc)
3019	9-3725	Dep.(mc)

Report	Abstract	Availability
AECU		
3020	9-3823	Dep.(mc)
3021	9-4205	Dep.(mc)
3022	9-5954	Dep.
3023	9-4858	Phys. Rev. 100, 295-302(1955) (Condensed)
3024	9-4145	Dep.(mc)
3025	9-4642	Dep.(mc)
3026	9-5075	Dep.(mc)
3027	9-5076	Dep.(mc)
3028	9-6507	Dep.
3029	9-4995	Dep.(mc)
3032	9-4994	Dep.(mc)
3033	9-5209	Dep.(mc)
3034	9-5404	Dep.(mc)
3035	9-5540	Dep.(mc)
3036	9-5287	Dep.
3038	9-5348	Dep.(mc)
3040	9-5720	Dep.(mc)
3041	9-5588	Dep.
3042	9-5697	Dep.(mc)
3044	9-5776	Dep.(mc)
3045	9-5721	Dep.(mc)
3047	9-5913	Dep.(mc)
3048	9-6092	Dep.(mc)
3049	9-5836	Dep.(mc)
3051	9-6226	Dep.(mc)
3052	9-5987	Dep.
3053	9-5944	Dep.(mc)
3054	9-7491	Dep.
3055	9-5955	Dep.(mc)
3056	9-6280	Dep.(mc)
3057	9-6281	Dep.(mc)
3059	9-6372	Dep.(mc)
3060	9-6341	Dep.(mc)
3061	9-6585	Dep.(mc)
3062	9-6646	Dep.(mc)
3066	9-7492	Dep.; $1.00 (GPO)
3067	9-7387	Dep.(mc)
3068	9-7388	Dep(mc)
3069	9-7104	Dep.(mc)
3070	9-7441	Dep.(mc)
3072	9-7744	Dep.(mc)
3073	9-7447	Dep.(mc)
3074	9-7427	Dep.(mc)
3075	9-7754	Dep.(mc)
ANL		
4863	9-930	Dep.
5122	9-4978	Dep.; $0.40
5135	9-127	Dep.
5221	9-6704	Dep.; $0.20
5227	9-618	Dep.
ANL		
5229	9-5646	Dep.
5256	9-340	Dep.(mc)
5262	9-6659	Dep.; $0.45
5276	9-1804	Dep.
5304	9-608	Dep.
5306	9-817	Phys. Rev. 98, 1327-9(1955)
5312	9-925	Dep.
5316	9-434	Dep.
5317	9-988	Dep.
5319	9-2691	Dep.
5332	9-3	Dep.
5359	9-3501	Dep.
5365	9-1231	J. Am. Chem. Soc. 77, 2737-9(1955)
5368	9-4237	Dep.
5378	9-2536	Dep.
5378(p.2-64)	9-2539	
5378(p.65-186)	9-2547	
5381	9-2949	Dep.
5386	9-2500	Dep.
5396	9-7095	Dep.
5397	9-6748	Dep.
5403	9-6254	Dep.; $0.30
5405	9-3786	Dep.
5410	9-4074	Dep.; $0.50
5417	9-4477	Dep.
5424	9-6767	Dep.; $1.75
5426	9-4911	Dep.
5429	9-7692	Dep.; $0.30
5430	9-6991	Dep.; $0.30
5433	9-6204	Dep.; $0.20
5451	9-6868	Dep.
5453	9-6945	Dep.
5456	9-6820	Dep.
5462	9-6946	Dep.; $0.25
5482	9-7981	Dep.; $0.60
ANL-FGF		
1	9-6236	Dep.(mc)
3	9-6237	Dep.(mc)
4	9-6633	J. Metals 7, 1199-1205(1955)
APEX		
176	9-2983	Dep.; $0.55
179	9-2700	Dep.
186	9-4986	Dep.
BM-RI		
5126	9-4167	Dep.(mc)
BMI		
282	9-5297	Dep.(mc)
706	9-1503	Dep.; $0.35
970	9-1854	Dep.; $0.20
982	9-3118	Dep.(mc); Ind. Dep.

Report	Abstract	Availability
BMI		
994	9-4792	Dep.
1000	9-5349	Dep.; $0.90
1003	9-5350	Dep.; $0.30
1004	9-5351	Dep.; $0.15
1019	9-6661	Dep.
1020	9-6647	Dep.
1033	9-7288	Dep.
BMI-T		
23	9-7345	Dep.; $0.10
39	9-6284	Dep.; $0.25
BNL		
174	9-6227	Dep.
221	9-5762	Dep.(mc)
278	9-695	Dep.; $0.55
280	9-3975	Dep.; $0.25
303	9-4038	Dep.
305	9-3004	Dep.
308	9-726	Dep.; $0.25
314	9-2099	Dep.
317	9-1781	Dep.; $0.20
321	9-5419	Dep.; $0.35
322	9-3285	Dep.; $0.25
323	9-3120	Dep.; $0.15
325	9-7096	Dep.; $3.50 (GPO)
326	9-4039	Dep.
331	9-5138	Dep.; $0.80
334	9-5493	Dep.
337	9-5206	Dep.
340	9-5815	Dep.; $0.20
341	9-7060	Dep.; $0.10
344	9-6400	Dep.; $0.95
351	9-6401	Dep.; $0.20
353	9-6177	Dep.; $0.20
358	9-7068	Dep.; $0.20
1694	9-28	Genetics 39, 587-603(1954)
1696	9-859	J. Polymer Sci. 14, 427-42(1954)
1781	9-1234	Nucleonics 12, No. 12, 14-18(1954); Dep.(mc)
1794	9-1416	Dep.(mc)
1816	9-1417	Dep.(mc)
1828	9-4364	J. Appl. Physiol. 7, 542-8(1955)
1831	9-1211	Anal. Chem. 27, 166-7(1955); Dep.(mc)
1835	9-472	Arch. Internal Med. 94, 525-31(1954)
1854	9-2144	J. Chem. Phys. 23, 152-4(1955)
1855	9-922	Testile Research J. 24, 785-91(1954)
1857	9-4099	Combined with BNL-1885 and BNL-1886 in J. Chem. Phys. 23, 673-80(1955)
1858	9-873	J. Am. Chem. Soc. 76, 6006-8(1954)
1874	9-1315	Nucleonics 13, No. 4, 56(1955) (Condensed); Dep.(mc)
1879	9-1782	J. Chem. Phys. 22, 2026-9(1954)
1880	9-3369	Ann. N. Y. Acad. Sci. 59, 514-35(1955)

Report	Abstract	Availability
BNL		
1885	9-4099	Combined with BNL-1857 and BNL-1886 in J. Chem. Phys. 23, 673-80(1955)
1886	9-4099	Combined with BNL-1857 and BNL-1885 in J. Chem. Phys. 23, 673-80(1955)
1888	9-530	J. Am. Chem. Soc. 76, 4054(1954)
1890	9-473	J. Biol. Chem. 211, 279-87(1954)
1891	9-561	Nucleonics 12, No. 11, 55(1954)
1900	9-4903	Chap. 24(pp. 767-94) in "Beta- and Gamma-Ray Spectroscopy," Kai Siegbahn, ed. New York, Interscience Publishers, Inc. 1955. 959p. $20.00
1903	9-565	Nucleonics 12, No. 11, 61(1954)
1906	9-996	J. Chem. Phys. 22, 1924-5(1954)
1907	9-4957	J. Chem. Phys. 23, 853-8(1955)
1910	9-4661	Am. J. Physiol. 180, 498-502 (1955)
1912	9-311	Rev. Sci. Instr. 25, 1025(1954)
1915	9-765	Phys. Rev. 96, 709-12(1954)
1925	9-587	Nucleonics 12, No. 11, 75(1954)
1931	9-610	Nucleonics 12, No. 11, 78-9(1954)
1940	9-1729	Biol. Bull. 107, 329-34(1954)
1944	9-1132	Phys. Rev. 96, 1014-17(1954)
1945	9-3006	Proc. Natl. Acad. Sci. U. S. 41, 155-8 (1955)
1950	9-2840	J. Chem. Phys. 23. 477-82(1955); Dep.(mc)
1961	9-2648	J. Phys. Chem. 59, 189-91(1955)
1962	9-124	Arch. Biochem. and Biophys. 52, 484-5 (1954)
1964	9-2656	Nucleonics 13, No. 2, 48(1955)
1967	9-3061	J. Am. Chem. Soc. 77, 1388-90(1955)
1977	9-991	Phys. Rev. 96, 951-68(1954)
1980	9-6835	pp. 250-5 of "The Thyroid—Report of Symposium held June 9 to 11, 1954—Brookhaven Symposia in Biology No. 7". Washington, Office of Technical Services, Feb. 1955. 271p. $1.75
1995	9-1588	Rev. Sci. Instr. 25, 1219(1954)
1996	9-7530	Dep.(mc)
1998	9-1679	Phys. Rev. 96, 1610-13(1954)
1999	9-5577	Science 121, 469-70(1955)
2002	9-3279	Phys. Rev. 97, 1023-4(1955)
2004	9-483	Science 120, 809-10(1954)
2010	9-1054	Rev. Sci. Instr. 25, 1129(1954)
2013	9-2921	Phys. Rev. 97, 766-9(1955)
2029	9-5929	Biochem. J. (London) 60, 447-53(1955)
2039	9-1986	Phys. Rev. 97, 181-3(1955)
2041	9-7289	Dep.(mc)
2045	9-1154	Genetics 40, 460-75(1955)
2046	9-7631	Genetics 40, 490-9(1955)
2047	9-2940	Phys. Rev. 97, 797-808(1955)
2049	9-4683	Cancer 8, 601-15 (1955)
2050	9-4663	Trans. N. Y. Acad. Sci. 17, 194(1955) (Condensed)
2052	9-475	Science 121, 641-2(1955); Dep.(mc)
2055	9-3645	Phys. Rev. 97, 1199-1204(1955)
2056	9-4303	Phys. Rev. 98, 100(1955)
2057	9-6894	J. Chem. Phys. 23, 1535-9(1955)

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Report	Abstract	Availability
BNL		
2059	9-4621	Nucleonics 13, No. 5, 60(1955) (Condensed)
2060	9-1355	Phys. Rev. 96, 1450-2(1954)
2061	9-5530	J. Appl. Phys. 26, 652-4(1955)
2062	9-3718	Am. J. Botany 42, 384-94(1955)
2063	9-476	Dep.(mc)
2064	9-1682	Phys. Rev. 96, 1712-13(1954)
2066	9-2922	Phys. Rev. 97, 780-2(1955)
2068	9-5993	I.R.E. Trans. Nuclear Sci. NS-2, 9-11(1955)
2071	9-1155	Arch. Biochem. Biophys. 54, 556-7(1955); Dep.(mc)
2072	9-3337	Phys. Rev. 97, 991-1002(1955).
2075	9-1366	Rev. Sci. Instr. 26, 232-3(1955); Dep.(mc)
2088	9-2006	Phys. Rev. 97, 243(1955)
2089	9-3651	Phys. Rev. 97, 1303-4(1955)
2096	9-2692	A.I.Ch.E. Journal 1, 342-8(1955)
2099	9-4090	J. Chem. Phys. 23, 759-60(1955)
2106	9-5893	J. Biol. Chem. 215, 263-8(1955)
2107	9-6823	Stain Technol. 30, 135-8(1955)
2113	9-2787	Dep.(mc)
2114	9-2200	J. Am. Chem. Soc. 77, 507(1955)
2115	9-4759	Science 121, 715-17(1955)
2128	9-3680	Phys. Rev. 97, 1314-24(1955)
2129	9-6131	Dep.(mc)
2130	9-7290	Dep.(mc)
2135	9-5594	J. Am. Chem. Soc. 77, 2651-3(1955)
2140	9-2413	Rev. Sci. Instr. 26, 402-3(1955); Dep.(mc)
2142	9-7182	J. Appl. Phys. 26, 1044-9(1955)
2143	9-3318	Phys. Rev. 97, 1186-8(1955)
2144	9-4622	Phys. Rev. 98, 418-25(1955)
2147	9-4556	Phys. Rev. 98, 639-45(1955)
2149	9-5853	Science 122, 197(1955)
2152	9-7227	Radiation Research 3, 1-17(1955)
2153	9-4257	Phys. Rev. 98, 121-30(1955)
2154	9-3238	Phys. Rev. 97, 1179-80(1955)
2157	9-4632	Phys. Rev. 98, 653-7(1955)
2163	9-4587	Phys. Rev. 98, 492-4(1955)
2165	9-5805	Phys. Rev. 98, 1721 7(1955)
2167	9-5883	Chemistry and Industry, 716-17(1955)
2169	9-6220	J. Am. Chem. Soc. 77, 3689-92(1955)
2176	9-4102	J. Chem. Phys. 23, 784-5(1955)
2177	9-4270	Phys. Rev. 98, 212-14(1955)
2181	9-5477	Phys. Rev. 98, 1267-71(1955)
2189	9-5486	Phys. Rev. 98, 1369-86(1955)
2191	9-2191	J. Biol. Chem. 216, 245-50(1955)
2193	9-7247	Arch. Biochem. Biophys. 57, 506-14(1955)
2204	9-4262	Phys. Rev. 98, 218-19(1955)
2207	9-6800	J. Am. Chem. Soc. 77, 4619-22(1955)
2208	9-4259	Phys. Rev. 98, 205-6(1955)
BNL		
2223	9-5702	Phys. Rev. 98, 1828-31(1955)
2224	9-6074	Phys. Rev. 99, 263-8(1955)
2231	9-7169	J. Appl. Phys. 26, 1041-3(1955)
2234	9-7440	J. Chem. Phys. 23, 988(1955)
2236	9-3755	Nucleonics 13, No. 4, 48-9(1955)
2238	9-6020	Phys. Rev 99, 277-81(1955)
2242	9-4216	Dep.(mc)
2248	9-7571	Nucleonics 13, No. 7, 42(1955)
2254	9-6143	Phys. Rev. 99, 180-3(1955)
2255	9-4044	Proc. Natl. Acad. Sci. U. S. 41, 295-300 (1955)
2257	9-7755	Dep.; $0.25
2281	9-7716	J. Am. Chem. Soc. 77, 4960-4(1955)
2275	9-4100	Dep.(mc)
2276	9-7131	Phys. Rev. 99, 810-24(1955)
2277	9-6045	Phys. Rev. 99, 10-32(1955)
2280	9-6443	J. Nuclear Energy 1, 237-43(1955)
2282	9-5230	Proc. Soc. Expti. Bio. Med. 89, 28-31 (1955)
2284	9-4042	pp.80-5 of Proceedings of the Third National Air Pollution Symposium, April 18-20, 1955, Pasadena, Calif.
2287	9-6016	Phys. Rev. 99, 229-41(1955)
2294	9-4207	Dep.(mc)
2296	9-7886	Phys. Rev. 99, 1833-5(1955)
2298	9-7509	Phys. Rev. 99, 1347-51(1955)
2303	9-7132	Phys. Rev. 99, 825-33(1955)
2305	9-5245	Dep.(mc)
2308	9-7196	Phys. Rev. 99, 695-702(1955)
2313	9-5611	Phys. Rev. 98, 1859-60(1955)
2326	9-6026	Phys. Rev. 99, 338-9(1955)
2328	9-7559	Electronics 28, No. 10, 151-3(1955)
2343	9-5598	Dep.(mc)
2348	9-7511	Phys. Rev. 99, 1400-5(1955)
2357	9-7099	J. Chem. Phys. 23, 1540(1955)
2370	9-7575	Phys. Rev. 99, 1618-19(1955)
2379	9-7523	Phys. Rev. 99, 1606(1955)
2407	9-6173	Dep.(mc)
2409	9-6636	Dep.(mc)
2423	9-7097	Phys. Rev. 99, 1032-3(1955)
2426	9-6777	Dep.(mc)
BNL-L		
62(p.159-62)	9-1376	LC
BRB		
6	9-6092	Dep.

Report	Abstract	Availability
CF (Argonne National Lab.)		
52-4-156	6-3333	Nucleonics 13, No. 8, 48-9(1955)
CF (ORNL)		
53-12-111	9-2984	See ORNL-1840
54-6-125	9-4732	Anal. Chem. 27, 842-4(1955)
54-9-54	9-3803	Nucleonics 13, Vol. 4, 66-9(1955) (Condensed)
COO		
143	9-7022	Dep.(mc)
148	9-3890	Dep.(mc)
161	9-685	Chem. Eng. Progr. 50, 560-4(1954)
163	9-2211	Anal. Chem. 27, 83-7(1955)
172	9-7893	Dep.
177	9-7944	Dep.
186	9-539	Anal. Chem. 26, 1572-5(1954)
206	9-1530	Dep.(mc); Ind. Dep.
CU		
15-54-AEC-1019-Chem.	9-1590	See NYO-6139
16-54-AEC-1019-Chem.	9-7536	See NYO-6140
20-54-AEC-904-MET	9-1861	See NYO-3968
72-54-ONR-110-1-Phys.	9-5459	See NEVIS-5
73-54-ONR-110-1-Phys.	9-5460	See NEVIS-6
83-55-ONR-110-1-Phys.	9-5448	See NEVIS-9
85-55-ONR-110-1-Phys.	9-5449	See NEVIS-11
86-55-ONR-110-1-Phys.	9-5739	See NEVIS-12
134	9-3965	Dep.(mc)
143	9-6751	Dep.(mc)
DOW		
134	9-6942	Dep.(mc)
DP		
62	9-1598	Dep.; $0.15
79	9-298	Dep.; $0.10
81	9-153	Dep.(mc)
88	9-1196	Nucleonics 13, No. 10, 46-7(1955)
93	9-1596	Dep.; $0.15
94	9-2725	Dep.
95	9-1942	Dep.; $0.10
99	9-2194	Dep.; $0.15
101	9-4845	Dep.
107	9-5352	Dep.
110	9-3925	Dep.
111	9-3926	Dep.
DP		
112	9-4229	Dep.
115	9-6064	Dep.
124	9-7065	Dep.; $0.15
129	9-7854	Dep.; $0.10
EGG		
1068	9-5539	Dep.(mc)
F-TS		
7083-RE	9-3911	see AEC-tr-2106
7471-RE	9-5313	See ATI-118811
FMPC		
471	9-1283	Dep.; $0.25
GEL		
90	9-609	Dep.
HEPL (Misc.)		
46	9-5165	Dep.(mc)
HW		
10792	9-399	Dep.; $0.10
26500	9-5284	Dep.
29071(Rev.)	9-629	Dep.; $0.10
30185	9-3212	Dep.(mc) $0.20
30220	9-501	Dep.(mc)
30231	8-6077	Radiation Research 2, 166-70(1955)
30340	9-12	Dep.(mc)
30781	9-549	Nucleonics 12, No. 11, 54(1954) (Condensed); Dep.; $0.25
31925	9-368	Dep.; $0.20
31961	9-2950	Dep.
32058	9-5463	Dep.
32121	9-400	Dep.(mc); Ind. Dep.
32166	9-696	Dep.; $0.25
32626	9-585	Dep.
32676	9-128	Dep.
33122	9-3927	Dep.; $0.20
33680	9-4733	Anal. Chem. 27, 849-50(1955)
33681	9-6174	Dep.
33744	9-1703	Dep.(mc)
33881	9-3825	Dep.
33953	9-6240	Dep.
34032	9-942	Dep.(mc)
34476	9-5147	Nucleonics 13, No. 8, 30-3(1955)
35174	9-3752	Dep.(mc) $0.20
35807	9-7707	Dep.
35808	9-7708	Dep.
36734	9-5837	Dep.(mc)
IDO		
14301	9-6194	Dep.
14318	9-6896	Dep.

Report	Abstract	Availability
IDO		
14330	9-533	Dep.(mc)
14329	9-6604	Dep.
14340	9-5420	Dep.(mc)
14349	9-6897	Dep.
16073	9-2446	Dep.; $0.25
16110(1st Rev.)	9-5422	Dep.; $0.15
16115(1st Rev.)	9-6027	Dep. $0.20
16120(1st Rev.)	9-5423	Dep.; $0.35
16149(1st Rev.)	9-5424	Dep.; $0.30
16194	9-271	Dep.(mc)
16205	9-2050	Dep.(mc) $0.20
16218	9-5531	Dep.(mc)
16225	9-6039	Dep.
16228	9-5148	Dep.(mc)
16237	9-7833	Dep.; $0.15
MCC		
2033	9-7673	See RMO-2013
2038	9-7270	See RMO-2018
2039	9-6879	See RMO-2019
2166	9-7271	See RMO-2031
2207	9-5879	See RMO-2036
2217	9-5880	See RMO-2046
2218	9-5881	See RMO-2047
ISC		
258(Rev.)	9-2155	J. Am. Chem. Soc. 77, 324-5(1955)
380	9-2788	Dep.; $0.75
405	9-1759	Anal. Chem. 27, 947-9(1955) (Condensed)
437(Rev.)	9-586	Dep.; $0.20
454	9-1599	Rev. Sci. Instr. 26, 929-36(1955)
464	9-1302	Dep.(mc)
465	9-595	J. Phys. Chem. 58, 908-11(1954)
466	9-1121	Dep.; $0.35
480	9-2082	Spectrochim. Acta 6, 341-72(1954)
497	9-1036	Dep.; $0.55
498	9-2821	Dep.; $0.60
499	9-1037	Dep.(mc); Ind. Dep.
509	9-4081	Anal. Chem. 27, 572(1955)
510	9-2951	Dep.; $0.35
511	9-1680	Phys. Rev. 96, 1620(1954)
512	9-1790	J. Phys. Chem. 59, 496-8(1955)
515	9-802	Dep.; $0.30
516	9-5272	Anal. Chem. 27, 1010-14(1955)
517	9-2133	Dep.; $0.15
518	9-989	Dep.; $0.15
520	9-875	Dep.; $0.35
521	9-851	Dep.; $0.30
522	9-2506	Phys. Rev. 97, 432-3(1955)

Report	Abstract	Availability
ISC		
523	9-4715	J. Phys. Chem. 59, 410-15(1955)
525	9-4713	J. Phys. Chem. 59, 391-5(1955)
533	9-1994	Dep.(mc)
534	9-7258	Dep.; $0.30
535	9-6484	Dep.; $0.25
537	9-3339	Phys. Rev. 97, 1031-3(1955)
542	9-5253	J. Am. Chem. Soc. 77, 2965-71(1955)
543	9-1219	J. Phys. Chem. 59, 549-52(1955)
544	9-5596	J. Am. Chem. Soc. 77, 3198-9(1955)
546	9-6610	J. Phys. Chem. 59, 680-2(1955)
547	9-931	Dep.; $0.10
548	9-1212	Dep.(mc); Ind. Dep.
550	9-1247	Dep.; $0.10
551	9-1213	Dep.; $0.20
552	9-3444	Dep.(mc)
553	9-1481	Dep.(mc); Ind. Dep.
554	9-1760	Spectrochim. Acta 7, 175-8(1955)
557	9-6631	J. Am. Chem. Soc. 77, 4212-17(1955)
558	9-2022	Rev. Sci. Instr. 26, 594-8(1955)
559	9-5890	Anal. Chem. 27, 1311-14(1955)
560	9-2382	Dep.(mc); Ind. Dep.
561	9-2023	Rev. Sci. Instr. 26, 598-600(1955)
564	9-2726	J. Metals 7, 1219-20(1955)
565	9-3052	J. Am. Chem. Soc. 77, 3964-6(1955)
566	9-6178	Dep.; $0.30
567	9-7105	Dep.; $0.30
569	9-3246	J. Am. Chem. Soc. 77, 1393(1955)
571	9-7699	Anal. Chem. 27, 1653-5(1955)
572	9-3170	Dep.
577	9-4266	Dep.(mc)
578	9-3242	Dep.(mc); Ind. Dep.
581	9-3053	J. Am. Chem. Soc. 77, 4217-19(1955)
583	9-6054	Phys. Rev. 99, 137-8(1955)
590	9-4967	J. Phys. Chem. 59, 1072-3(1955)
594	9-4949	Dep.(mc)
595	9-5956	Dep.(mc)
598	9-5406	Dep.
599	9-5110	Dep.(mc)
602	9-4970	Dep.(mc)
604	9-5618	Dep.
608	9-5755	Dep.
611	9-5621	Dep.
620	9-6624	Dep.
621	9-6625	Dep.
625	9-6626	Dep.

Report	Abstract	Availability
ISC		
626	9-7726	Dep.(mc)
630	9-7166	Dep.
632	9-7106	Nuovo cimento (10) 2, 857-9(1955)
633	9-6609	Dep.
K		
1148	9-898	Dep.
1186	9-2789	Dep.; $0.20
1187	9-3445	Dep.
1190	9-2838	Dep.; $0.55
1191	9-3213	Dep.
1204	9-3410	Dep.
1213	9-4396	Dep.
1225	9-5931	Dep.
1234	9-7021	Dep.; $0.20
1239	9-6634	Dep.
KAPL		
336	9-6028	Dep.
709	9-7748	Dep.; $0.50
731	9-7722	Dep.; $0.35
950	9-369	Dep.
973	9-4117	Dep.
1067	9-5589	Dep.
1138	9-3286	Dep.
1161	9-3121	Dep.
1178	9-36	Dep.; $0.20
1180	9-426	Acta Cryst. 8, 371-8(1955)
1198	9-154	Dep.
1201	9-300	Nucleonics 13, No. 5, 54-6(1955); Dep.
1205	9-172	Dep.
1213	9-272	Dep.
1227	9-969	Dep.
1231	9-1038	Dep.
1232	9-819	Dep.
1236	9-1308	Dep.
1237	9-1317	Dep.
1241	9-1655	Dep.
1242	9-1118	Dep.
1243	9-1582	Dep.
1248	9-1822	Dep.
1262	9-2517	Dep.
1265	9-2689	Dep.
1269	9-2927	J. Appl. Phys. 26, 923-31(1955)
1275	9-2162	Anal. Chem. 27, 1330-1(1955)
1276	9-2827	Dep.
1277	9-2655	Dep.
1280	9-3287	Dep.
1300	9-4075	Anal. Chem. 27, 1805(1955)
1303	9-4822	Dep.
1307	9-4010	Dep.
1309	9-4169	Dep.
KAPL		
1312	9-4514	Dep.
1333	9-4846	Dep.; $0.40
1336	9-4564	Dep.; $0.25
1337	9-4959	J. Am. Chem. Soc. 77, 4723-6(1955)
1350	9-6236	Dep.; $0.15
1366	9-6926	Dep.
1367	9-6643	Dep.
1371	9-6994	Dep.
1375	9-7839	Dep.
1398	9-6872	Dep.
KLI		
2848	9-6608	J. Phys. Chem. 59, 763-8(1955)
KLX		
1395	9-3122	Dep.; $0.25
LA		
493	9-6141	Dep.(mc)
1651	9-619	Dep.
1654	9-376	Dep.
1667	9-1823	Dep.
1668	9-620	Dep.
1686	9-155	Dep.
1694	9-301	Dep.
1706	9-1761	Dep.; $0.30
1713	9-302	Dep.
1721	9-876	Dep.; $1.25
1725	9-692	Dep.
1727	9-1896	J. Chem. Phys. 23, 1349-50(1955) (Condensed)
1734	9-1697	Dep.
1736	9-2016	Phys. Rev. 98, 41-2(1955); Dep.
1740	9-1551	Dep.; $0.25
1835	9-3928	Dep.
1837	9-1600	Nucleonics 13, No. 5, 62(1955); Dep.
1845	9-1762	Dep.
1848	9-1711	Dep.
1849	9-3007	Dep.; $0.50
1851	9-1739	Ind. Med. and Surg. 24, 287-92(1955)
1855	9-1740	Dep.
1856	9-1943	Dep.
1858	9-6605	Dep.
1862	9-6245	Dep.
1864	9-4110	Dep.; $0.25
1867	9-3811	Dep.
1872	9-7443	Dep.; $0.40
1873UNM	9-4414	Dep.
1878	9-3913	Dep.
1884	9-4941	Dep.
1886	9-5256	Dep.
1890	9-5625	Dep.
1891	9-4507	Dep.; $0.25

Report	Abstract	Availability
LA		
1894	9-5111	Dep.; $0.20
1901	9-5723	Dep.
1904	9-5257	Dep.
1906	9-6377	Dep.
1908	9-5137	Dep.
1913	9-6952	Dep.
1917	9-6706	Dep.
1920	9-7291	Dep.
1923	9-6724	Nucleonics 13, No. 11, 91-7(1955)
1926(UNM	9-6179	Dep.
1943	9-7444	Dep.
LRL		
117	9-7292	Dep.; $0.15
138	9-370	Dep.; $0.25
145	9-799	Dep.; $0.15
157	9-144	Dep.(mc); Ind. Dep.
MITS		
26	9-3111	See NYO-6263
27	9-4980	See NYO-7170
MC		
240	9-772	Dep.; $0.25
252	9-3660	See AECU-2995
258	9-3508	Rev. Sci. Instr. 26, 134-204(1955)
MLM		
656	9-1479	Dep.; $0.25
795	9-76	Dep.(mc)
798(Rev.)	9-1490	Dep.
818	9-1236	Dep.
42	9-5727	Superseded by Anal. Chem. 27, 1073-6(1955)
858	9-7453	Dep.; $0.10
871	9-3929	Dep.
881	9-1475	Dep.; $0.25
901	9-54	Dep.
909	9-3757	Dep.; $0.20
921	9-1235	Dep.
934	9-2181	Dep.
938	9-2399	Anal. Chem. 27, 567-9(1955); Dep.
941	9-4638	Dep.
942	9-6117	Phys. Rev. 99, 1-2(1955)
943	9-2952	Dep.
956	9-2844	Dep.
967	9-2671	Dep.
970	9-2054	Dep.; $0.20
973	9-4060	Dep.
979	9-4365	Dep.; $0.25
997	9-2332	Dep.

Report	Abstract	Availability
MLM		
1002	9-3793	Dep.
1045	9-7056	Dep.; $0.15
MMPP		
75-1	9-4870	Dep.
MonP		
366	9-7066	Dep.; $0.20
MTA		
45	9-774	Dep.(mc)
NAA-AER		
1018	9-1953	Nucleonics 13, No. 1, 64(1955) (Condensed)
NAA-SR		
262	9-5959	Dep.
278	9-2	Dep.; $0.30
863	9-3097	Dep.(mc)
985	9-139	Dep.; $0.40
1014	9-631	Dep.
1050	9-852	Dep.
1061	9-1478	Dep.; $0.15
1103	9-2163	Dep.; $0.15
1111	9-4452	Dep.
1137	9-7855	Dep
1153	9-4723	Dep.
1159	9-3861	Dep.; Ind. Dep.
1198	9-6922	Dep.
1203	9-4701	Dep.
1226	9-4734	Dep.
1239	9-3862	Dep.
1264	9-4725	Dep.
1357	9-6925	Dep.
1367	9-7389	Dep.
1390	9-7390	Dep.
1459	9-7951	Dep.
NAA-SR-Memo		
685	9-6478	Dep.
707	9-4285	Dep.(mc)
1107	9-3914	Dep.; Ind. Dep.
NRL		
104	9-3070	Dep.
106	9-4381	Anal. Chem. 27, 1551-4(1955)
108	9-6620	Dep.
NBS		
1632	9-6677	Dep.(mc)

Report	Abstract	Availability
NYO		
4604	9-534	Dep.
4616	9-2855	Dep.; $0.20
4630	9-4777	Dep.
4631	9-7752	Dep.
4659	9-7636	Dep.; $0.10
4917	9-3047	Radiology 65, 489-502(1955)
4918	9-4691	Dep.
4919	9-4666	Dep.
4920	9-4667	Dep.
4921	9-4358	Dep.
4964	9-17	Cancer Research 15, 100-4(1955); Dep.
4968	9-18	Dep.(mc)
4986	9-1736	J. Gen. Physiol. 38, 389-404(1955)
4987	9-1735	J. Gen. Physiol. 38, 371-88(1955)
4989	9-4066	J. Histochem. Cytochem. 3, 103-21(1955)
4990	9-1704	Dep.; $0.80
6030	9-5928	Combined with NYO-3386 and issued as NYO-6038
6035	9-5927	J. Am. Chem. Soc. 77, 3634-6(1955)
6038	9-5928	J. Am. Chem. Soc. 77, 3656-8(1955)
6039	9-5884	J. Am. Chem. Soc. 77, 3647-8(1955)
6052	9-7309	Radiation Research 3, 68-76(1955)
6059	9-1511	Dep.(mc)
6060	9-3461	Dep.
6061	9-3462	Dep.
6062	9-1826	Dep.(mc)
6063	9-1827	Dep.(mc)
6072	9-401	Dep.(mc)
6102	9-262	Dep.(mc)
6103	9-91	Dep.(mc)
6105	9-7392	Dep.(mc)
6114	9-1862	Dep.(mc); Ind. Dep.
6139	9-1590	Dep.(mc)
6140	9-7536	Dep.(mc)
6168 [Pt. 1.]	9-646	J. Electrochem. Soc. 101, 124-7(1954)
6256	9-166	Mining Eng. 6, 925-8(1954)
6257	9-1486	Mining Eng. 6, 1196-1202(1954); Dep.(mc)
6259	9-1476	Anal. Chem. 27, 467-8(1955); Dep.(mc)
6261	9-3107	Mining Eng. 7, 66-72(1955)
6262	9-623	Dep.(mc)
6263	9-3111	Dep.(mc); Ind. Dep.
6267	9-6029	Dep. $0.15
6269	9-6030	Dep. $0.30
6273	9-5173	Dep.; $0.10
6277	9-864	J. Am. Chem. Soc. 76, 5833-9(1954)
6278	9-865	J. Am. Chem. Soc. 76, 5839-42(1954)
6296	9-653	Dep.
6297	9-2702	Dep.
6323	9-637	Dep.
6324	9-2735	Dep.
6325	9-4482	Dep.
6327	9-7351	Dep.
NYO		
6386	9-3096	J. Am. Chem. Soc. 76, 6210(1954)
6387	9-6937	J. Inorg. and Nuclear Chem. 1, 165-74(1955)
6391	9-3113	Can. J. Chem. 33, 245-50(1955)
6402	9-1187; 9-1229	J. Am. Chem. Soc. 76, 4755-63(1954); J. Am. Chem. Soc. 76, 4763-5(1954)
6403	9-109	J. Am. Chem. Soc. 76, 5216-20(1954)
6446	9-946	Dep.
6447	9-2793	Dep.
6449	9-4779	Dep.
6450	9-7327	Dep.
6511	9-2496	Dep.
6513	9-7567	Dep.
6519	9-6228	Dep.
6538	9-776	Phys. Rev. 97, 783-91(1955); Dep.(mc)
6541	9-1653	Dep.(mc)
6542	9-1140	Dep.(mc)
6543	9-1946	Dep.(mc)
6544	9-7215	Phys. Rev. 99, 989-95(1955)
6546	9-7082	Phys. Rev. 99, 897-905(1955)
6549	9-5468	Phys. Rev. 98, 1523-4(1955)
6561	9-1565	Dep.(mc)
6567	9-777	Dep.(mc)
6568	9-1108	Dep.(mc)
6570	9-1909	Phys. Rev. 97, 240-2(1955)
6571	9-1111	Phys. Rev. 96, 1104-15(1954)
6572	9-1660	Phys. Rev. 96, 1654-8(1954)
6574	9-790	Phys. Rev. 96, 812(1954)
6583	9-245	Phys. Rev. 96, 532-3(1954)
6584	9-1114	Phys. Rev. 96, 1156-7(1954)
6585	9-869	J. Am. Chem. Soc. 76, 5867-8(1954)
6589	9-3390	J. Phys. Chem. 59, 235-7(1955)
6595	9-971	Dep.
6596	9-3675	J. Appl. Phys. 26, 128-9(1955)
6597	9-3886	J. Appl. Phys. 26, 491-2(1955)
6605	9-2151	J. Am. Chem. Soc. 77, 258-60(1955)
6608	9-4070	J. Am. Chem. Soc. 77, 265-6(1955)
6609	9-4071	J. Am. Chem. Soc. 77, 1994-5(1955)
6610	9-4372	J. Am. Chem. Soc. 77, 2071-3(1955)
6611	9-4072	J. Am. Chem. Soc. 77, 2011-12(1955)
6613	9-7268	Dep.(mc)
6616	9-1467	Dep.
6617	9-2135	Dep.
6618	9-4437	Dep.
6620	9-7269	Dep.
6625	9-1681	Phys. Rev. 96, 1711-12(1954)
6650	9-4408	J. Am. Chem. Soc. 77, 2187-9(1955)
6660	9-1356	Phys. Rev. 96, 1452-3(1954)
6666	9-4631	Phys. Rev. 98, 645-52(1955)
6668	9-2924	Rev. Sci. Instr. 26, 677-80(1955)
6669	9-5506	Phys. Rev. 96, 1289-92(1955)
6681	9-5904	Dep.(mc)
6682	9-5905	Dep.(mc)
7006	9-3177	Dep.

Report	Abstract	Availability
NBS		
1001	9-6711	LC
1001(p.1-40)	9-6712	
1001(p.41-60)	9-6713	
1001(p.61-75)	9-6714	
2307	9-6707	Dep.(mc)
2360a	9-6241	Dep.(mc)
2783	9-6708	Dep.(mc)
3339	9-273	Dep.(mc)
3676	9-5279	Dep.(mc)
3756	9-1418	Dep.
3845	9-3117	J. Research Natl. Bur. Standards 54, 267 8 (1955); Dep.; $0.20
3872	9-4738	Dep.(mc)
3924	9-6709	Dep.(mc)
3991	9-7052	Dep.(mc)
3992	9-3892	Dep.(mc)
4005	9-3893	Dep.(mc)
4031	9-6628	Dep.; $0.20
4059	9-5711	Dep.(mc)
4067	9-5700	Dep.
4084	9-7314	Dep.; $0.20
4094	9-5679	Dep.(mc)
4108	9-5717	Dep.(mc)
4109	9-5637	Dep.(mc)
4121	9-6242	Dep.(mc)
4122	9-5703	Dep.(mc)
4197	9-7037	Dep.(mc)
NDA		
13C-12	9-2031	Dep.(mc)
13C-39	9-1106	Dep.; $0.20
13C-40	9-1107	Dep.; $0.15
13C-48	9-5173	See NYO-6273
NDA-Memo		
13C-63	9-2518	Dep.(mc)
NEVES		
4	9-775	Phys. Rev. 97, 492-504(1955); Dep.(mc)
5	9-5459	Phys. Rev. 98, 1349-54(1955)
6	9-5460	Phys. Rev. 98, 1355-9(1955)
7	9-4253	Phys. Rev. 99, 885-90(1955)
8	9-4254	Nuovo cimento (10) 2, Suppl. 1, 151-62(1955)
9	9-5448	Dep.(mc)
10	9-5426	Dep.(mc)
11	9-5449	Phys. Rev. 100, 288-91(1955)
12	9-5739	Dep.(mc)
4441		
1197	9-7331	Dep.

Report	Abstract	Availability
NNES		
I-9	9-656	See TID-5211
I-11	9-145	See TID-5210
NYO		
474	9-820	Dep.
1040	9-6597	Dep.
1589	9-932	Dep.(mc)
1594	9-4831	Dep.(mc)
3075	9-2472	Dep.; $1.00
3131	9-800	Dep.
3135	9-7954	Phys. Rev. 99, 1891-2(1955)
3273	9-7715	Chap. I: J. Chem. Phys. 23, 466-70(1955); Dep.(mc)
3277	9-6554	Dep.; $0.25
3365	9-621	Dep.(mc)
3366	9-622	Dep.(mc)
3490	9-1285	J. Appl. Phys. 25, 1538-42(1954)
3497	9-2734	Dep.
3498	9-1860	Dep.
3525	9-58	J. Am. Chem. Soc. 77, 2119-29(1955)
3556	9-5605	Anal. Chem. 27, 1050-1(1955)
3605	9-3396	Anal. Chem 27, 459-61(1955)
3607	9-3395	Anal. Chem. 27, 340-6(1955)
3608	9-5269	Anal. Chem. 27, 961-5(1955)
3609	9-1205	Anal. Chem. Acta 11, 574-85(1954)
3626	9-953	Part A, p14-17; Part B, p10-13; Part C, p18-20 of: Proceedings of the Conference on Nuclear Processes in Geologic Settings, Williams Bay, Wisconsin, Sept. 21-23, 1953. (Printed by Univ. of Chicago Press, 1954)
3627	9-2265	Ann. Rev. Nuclear Sci. 4, 401-62(1954)
3637	9-1752	J. Phys. Chem. 59, 80-4(1955)
3697	9-5642	J. Metals 6, 1386-90(1954)
3711	9-5521	Phys. Rev. 98, 1276-80(1955)
3780	9-2051	Dep.(mc)
3781	9-1040	Dep.(mc)
3782	9-3932	Dep.(mc)
3791	9-2098	Dep.(mc)
3823	9-394	Dep.(mc)
3834	9-5545	Phys. Rev. 98, 1456-70(1955)
3845	9-1091	Phys. Rev. 96, 1100-3(1954)
3863	9-2854	Dep.(mc)
3885	9-4371	J. Am. Chem. Soc. 77, 2042-5(1955)
3896	9-3772	J. Am. Chem. Soc. 77, 1473-6(1955)
3905	9-7724	J. Chem. Phys. 23, 1596-8(1955)
3906	9-5537	Phys. Rev. 98, 1307(1955)
3917	9-636	Dep.(mc)
3934-II	9-4234	Dep.(mc)
3956(Suppl.)	9-2333	Dep.(mc)
3968	9-1861	Dep.
3974	9-2520	J. Opt. Soc. Amer. 45, 447-50(1955)
3975	9-4757	J. Opt. Soc. Amer. 45, 280-6(1955)
4005	9-5	Dep.(mc)
4603	9-531	Dep.(mc)

Report	Abstract	Availability
NYO		
7042	9-972	Dep.
7043	9-2294	Dep.
7044	9-4458	Dep.
7045	9-5661	Dep.(mc)
7046	9-5693	Dep.(mc)
7047	9-5986	Dep.(mc)
7072	9-973	Dep.
7073	9-2295	Dep.
7074	9-4459	Dep.
7100	9-654	Dep.(mc)
7102	9-6501	Dep.; $0.50
7103	9-5789	Dep.(mc)
7120	9-5298	J. Am. Chem. Soc. 77, 2978-83(1955)
7121	9-6936	J. Inorg. and Nuclear Chem. 1, 175-86(1955)
7122	9-6622	J. Phys. Chem. 59, 710-18(1955)
7125	9-4368	Dep.(mc)
7130	9-7083	Phys. Rev. 99, 905-11(1955)
7131	9-7554	Phys. Rev. 99, 1478-83(1955)
7133	9-7510	Phys. Rev. 99, 1387-92(1955)
7134	9-7178	Phys. Rev. 99, 1029-30(1955)
7168	9-7001	Dep.(mc)
7170	9-4980	Dep.(mc)
7209	9-7117	Phys. Rev. 99, 683-5(1955)
7212	9-6211	Dep.(mc)
7317	9-6001	Dep.(mc)
7402(Pt. 1)	9-6876	Dep.;
7475	9-7823	Dep.(mc)
ORNL		
332(1st. Rev.)	9-6725	Dep.; $1.25
976	9-6065	Dep. $0.25
991	9-2907	Dep.; $0.30
1027	9-1641	Dep.; $0.25
1572	9-371	Dep.; $0.45
1641	9-2633	Dep.; $0.20
1682	9-750	Dep.; $0.60
1742	9-5285	Dep.
1744	9-3411	Anal. Chem. 27, 453-4(1955)
1747	9-129	J. Am. Chem. Soc. 77, 2972-4(1955) (Condensed)
1769	9-1492	Dep.; $0.35
1779	9-655	Dep.; $0.35
1798	9-1067	Dep.
1799	9-5590	Dep.
1802	9-2794	Dep.; $0.20
1807	9-2831	Dep.; $0.25
1811	9-901	Dep.
1827	9-5258	Anal. Chem. 27, 1188-9(1955)
1828	9-2385	Dep.
1830	9-2991	Dep.; $0.55

Report	Abstract	Availability
ORNL		
1833	9-1825	Corrosion 11, 335t-42t(1955)
1840	9-2984	Dep.; $0.15
1842	9-2845	Dep.(mc)
1848	9-3384	J. Am. Chem. Soc. 77, 4705-7(1955)
1852	9-5382	Dep.
1861	9-4504	Dep.
1862	9-3330	Dep.; $0.15
1865	9-4842	Dep.
1871	9-7150	Dep.; $0.25
1872	9-4483	Brit. J. Radiol. 28, 342-50(1955)
1876	9-4240	Dep.; $0.45
1882	9-4703	Dep.
1883	9-4508	Dep.; $0.35
1891	9-7151	Dep.; $0.20
1899	9-5259	Dep.
1902	9-6390	Dep.; $0.15
1909	9-5260	Dep.
1910	9-5790	Dep.
1916	9-6354	Dep.
1917	9-6541	Dep.
1919	9-6397	Dep.
1925	9-7152	Dep.
1939	9-7058	Dep.
ORO		
121	9-1807	Dep.
131	9-185	Dep.
132	9-1445	Dep.; $0.45
133	9-1156	Dep.
134	9-1555	Dep.; $0.25
135	9-2208	Dep.(mc)
137	9-4101	Dep.
138	9-4997	Dep.
140	9-4747	Dep. (mc)
141	9-4748	Dep. (mc)
142	9-4771	Dep. (mc)
P		
395-AEC	9-3442	See AECU-2997
540-AEC	9-1863	See AECU-2996
585-AEC	9-2989	See AECU-2998
591-AEC	9-2990	See AECU-2999
663(Rand)	9-5404	See AECU-3034
R		
52GL167	9-5113	Dep.
53GL186	9-3288	Dep.
54GL269	9-609	See GEL-90
RL		
1148	9-189	See SO-2516

Report	Abstract	Availability
RL (Misc.)		
1175	9-187	See SO-2035
1190	9-188	See SO-2036
1191	9-190	See SO-2517
1237	9-1864	See SO-2037
1251	9-3179	See SO-2518
1259	9-3866	See SO-2038
1261	9-3180	See SO-2519
1291	9-3867	See SO-2039
1303	9-5058	See SO-2520
55-RL-1329	9-5662	See SO-2040
55-RL-1353	9-6195	See SO-2522
55-RL-1387	9-7674	See SO-2042
RM		
1420-AEC	9-2990	See AECU-2999
1457-AEC	9-5697	See AECU-3042
1492-AEC	9-5588	See AECU-3041
RME		
23(Pt. 1)	9-160	Dep.; $0.25
63	9-1512	Dep.; $0.35
69(Pt. 1)	9-1513	Dep.; $0.20
70	9-1256	Dep.; $0.25
71	9-1828	Dep.; $0.20
72	9-6651	Dep.; $0.15
1050(Rev.)	9-7757	Dep.; $0.15
1052	9-7333	Dep.; $0.20
1060	9-7758	Dep.; $0.15
2009	9-161	Dep.; $0.20
2010	9-1257	Dep.; $0.20
2011	9-2706	Dep.; $0.20
2012	9-3154	Dep.; $0.25
2013(Pt. 1, Rev.)	9-6963	Dep.; $0.20
2014(Pt. I and Suppl.)	9-7334	Dep.; $0.20
2016(Pt. I)	9-7759	Dep.; $0.15
2018	9-6652	Dep.
2019	9-5324	Dep.(mc)
2026	9-5325	Dep.(mc)
2030	9-5948	Dep.
2092	9-1829	Dep.
2102	9-2262	Dep.; $0.45
2103	9-1514	Dep.
2110(Pt.11)	9-4998	Dep.
4058	9-624	Eng. Mining J. 156, 119-22(1955); Dep.(mc)
4066	9-6964	Dep.
WAO		
55(Rev.)	9-7335	Dep.
1006	9-5921	Dep.
1007	9-6183	Dep.

Report	Abstract	Availability
RMO		
2013	9-7673	Dep.
2016	9-6877	Dep.
2017	9-6878	Dep.
2018	9-7270	Dep.
2019	9-6879	Dep.
2031	9-7271	Dep.
2034	9-6184	Dep.
2036	9-5879	Dep.
2046	9-5880	Dep.
2047	9-5881	Dep.
2731	9-1183	Dep.(mc)
2732	9-1746	Dep.(mc)
2734	9-5640	Dep.(mc)
2735	9-5641	Dep.(mc)
2944	9-1792	Dep.(mc)
SEP		
160	9-7220	Dep.; $0.20
SO		
2035	9-187	Dep.(mc)
2036	9-188	Dep.(mc); Ind. Dep.
2037	9-1864	Dep.(mc)
2038	9-3866	Dep.(mc)
2039	9-3867	Dep.(mc)
2040	9-5662	Dep.(mc)
2041	9-7352	Dep.(mc)
2042	9-7674	Dep.(mc)
2516	9-189	J. Metals 7, 395-400(1955)
2517	9-190	Dep.(mc); Ind. Dep.
2518	9-3179	Dep.(mc); Ind. Dep.
2519	9-3180	Dep.(mc); Ind. Dep.
2520	9-5058	Dep.(mc)
2521	9-7353	Dep.(mc)
2522	9-6195	Dep.(mc)
SUI		
55-1	9-5183	Dep.(mc)
TEI		
276	9-5001	Econ. Geol. 50, 186-95(1955)
284	9-5002	Econ. Geol. 50, 206-26(1955)
292	9-628	U. S. Geol. Survey Circ. 348, 1955
379	9-2638	Anal. Chem. 27, 258-62(1955)
389	9-7337	Econ. Geol. 50, 610-24(1955)
393	9-5649	Am. Mineralogist 40, 207-12(1955)
401	9-2514	Nuovo cimento 12, Suppl. No. 3, 549-71 (1954)
403	9-702	U. S. Geol. Survey Circ. 353, 1955
405	9-3829	Am. Mineralogist 40, 201-6(1955)
412	9-3398	Anal. Chem. 27, 475-6(1955)

Report	Abstract	Availability
TEI		
413	9-1522	U. S. Geol. Survey Bull. 1021-A, 1955; $0.15 (GPO)
415	9-162	Dep.; $0.80
417	9-3471	Am. J. Sci. 253, 121-4(1955)
418	9-3464	Geochim. et Cosmochim. Acta 7, 61-76 (1955)
430	9-4444	Bull. Geol. Soc. Amer. 66, 607-10(1955)
436	9-956	U. S. Geol. Survey Circ. 358, 1955
437	9-3466	U. S. Geol. Survey Circ. 349, 1955
450	9-880	Dep.; $0.25
453	9-78	Dep.; $0.25
461	9-881	Dep.; $0.10
466	9-6653	Dep.; $0.25
476	9-5651	U. S. Geol. Survey Bull. 1030-A, 1955
490	9-5326	Dep.; $1.75
492	9-5265	Anal. Chem. 27, 918-21(1955)
494	9-6268	Dep.; $0.20
496	9-6277	Geochim. et Cosmochim. Acta 7, 287-93(1955)
498	9-4945	Dep.(mc)
TEM		
341A	9-2263	Dep.; $0.45
443A	9-2709	Dep.; $0.25
471	9-3830	Am. Mineralogist 40, 261-74(1955)
643	9-5047	U. S. Geol. Survey Bull. 1015-H, (1955)
644	9-3828	U. S. Geol. Survey
647	9-3838	Science 121, 608-9(1955)
699	9-7775	Available from U. S. Geological Survey, as Geologic Quadrangle Map GQ-64(1955)
702	9-7339	Available from U. S. Geol. Survey, as Geologic Quadrangle Map GQ-65.
740	9-165	U. S. Geol. Survey Circ. 351, 1955
784	9-1515	Dep.; $0.25
TID		
82(Suppl. 2)	9-929	JCL
3032(Suppl. 1)	9-2077	Dep.; $0.20
3036(Rev.)	9-288	Dep.; $0.60
3039(Suppl. 1)	9-7002	Dep.; $0.40
3046(Suppl. 1)	9-7028	Dep.; $0.40
3058	9-233	Dep.; $0.25
3059	9-5360	Dep.; $0.30
3070	9-6185	Dep.; $0.80
3075	9-6186	Dep.; $0.40
4000	9-6146	Dep.; $1.00
4005(Pt. 1, 3rd Ed.)	9-6288	Dep.; $0.40
5001(1st Rev.)	9-2100	Dep.; $2.10
5059(2nd Rev.)	9-4658	Dep.; $1.25 (GPO)
5086(2nd Rev.)	9-6849	Dep.; $0.40
5131	9-7003	Dep.
5146	9-5623	Dep.(mc)
TID		
5156	9-4146	Dep.(mc)
5210	9-145	Dep.; $1.25
5211	9-656	Dep.; $1.00
5252	9-2535	Dep.; $1.85
5260	9-5882	Dep. $0.50
5261	9-5833	Dep. $1.00
5262	9-6066	Dep. $0.50
5275	9-6479	Dep.; $2.00 (GPO)
5276	9-6187	Dep.; $2.00 (GPO)
5277	9-6664	Dep.; $2.00 (GPO)
5280	9-7306	Dep.; $1.75
5281	9-7603	Dep.;
U		
23920	9-3723	See AECU-3017
UCLA		
304	9-700	Dep.; $0.25
305	9-1966	Dep.(mc)
309	9-1042	Nucleonics 13, No. 3, 58-60(1955); Dep.; $0.20
311	9-37	Dep.(mc)
312	9-3033	Dep.(mc)
313	9-106	Dep.(mc)
314	9-6	Dep.(mc)
315	9-701	Dep.(mc)
316	9-1488	Dep.; $1.05
317	9-846	Dep.(mc)
318	9-2164	Dep.; $0.25
319	9-1462	J. Lab. Clin. Med. 45, 665-78(1955)
321	9-1764	Dep.(mc)
322	9-2334	Dep.(mc)
323	9-3747	Proc. Soc. Exptl. Biol. Med. 88, 475-7 (1955)
324	9-2550	Dep.(mc)
327	9-3005	Dep.(mc)
328	9-3753	Dep.(mc)
331	9-4056	Dep.(mc)
332	9-4762	Dep.(mc)
333	9-4344	Dep.(mc)
334	9-4415	Dep.(mc)
335	9-4849	Dep.(mc)
339	9-6629	Dep.(mc)
340	9-5869	Dep.(mc)
341	9-5838	Dep.(mc)
342	9-6899	Dep.(mc)
UCRL		
314	9-6	J. Biol. Chem. 216, 333-50(1955)
1195(2nd Rev.)	9-4343	Phys. Rev. 98, 107-20(1955)
1427	9-778	Dep.; $0.25
1484(Rev.)	9-5991	Dep.
1651 (2nd Rev.)	9-773	Dep.(mc)
1880	9-2416	Rev. Sci. Instr. 26, 971-7(1955); Dep.; $1.35

Report	Abstract	Availability
UCRL		
1884(Rev.)	9-6495	Dep.
1889(Rev.)	9-6778	Dep.
2124(Rev.)	9-7224	Dep.
2301	9-402	Dep.; $2.55
2344(Rev.)	9-6496	Dep.
2351	9-34	J. Aviation Med. 25, 326-30(1954)
2393(2nd Rev.)	9-1659	Phys. Rev. 96, 1621-7(1954)
2435(Rev.)	9-5783	Dep.
2579	9-304	Dep.(mc)
2579(Rev.)	9-4245	Dep.(mc)
2580	9-1388	Phys. Rev. 96, 1267-8(1954)
2597	9-803	Phys. Rev. 96, 730-4(1954)
2613	9-4020	Ann. Rev. Nuclear Sci. 4, 157-90(1954)
2619	9-7296	Dep.(mc)
2621	9-767	Phys. Rev. 96, 714-15(1954)
2623	9-449	Dep.; $0.25
2631	9-2197	J. Am. Chem. Soc. 77, 2720-7(1955)
2632	9-123	J. Am. Chem. Soc. 77, 2779-83(1955)
2633	9-305	Dep.; $0.10
2637	9-1671	Phys. Rev. 96, 1549-53(1954)
2649	9-5546	Phys. Rev. 98, 1484-7(1955)
2650	9-4728	Anal. Chem. 27, 795-7(1955)
2653	9-1688	Dep.(mc)
2654	9-2060	Phys. Rev. 97, 117-20(1955)
2662	9-377	Dep.; $0.60
2666	9-107	Chem. Eng. 62, No. 4, 226-30(1955); Dep.; $0.25
2667	9-4328	Superseded by Phys. Rev. 98, 79-84(1955)
2669	9-1633	Phys. Rev. 96, 1568-72(1954)
2671	9-360	Phys. Rev. 96, 541(1954)
2677	9-7733	Dep.
2680	9-657	Dep.; $0.25
2681	9-117	Dep.(mc)
2682	9-48	Dep.(mc)
2683	9-59	Dep.; $0.10
2684	9-789	Phys. Rev. 96, 807-9(1954)
2685	9-1993	Phys. Rev. 97, 184-7(1955)
2689	9-7249	Dep.
2689(Add.)	9-7250	Dep.
2694	9-60	Dep.(mc)
2695	9-2998	Phys. Rev. 97, 823-30(1955)
2696	9-1480	Dep.(mc); Ind. Dep.
2698	9-3662	Dep.
2699	9-378	Dep.(mc)
2700	9-3652	Phys. Rev. 97, 1305-13(1955)
2704	9-102	Radiation Research 3, 52-67(1955)
2708	9-395	Rev. Sci. Instr. 26, 666-71(1955)
2709	9-61	Dep.(mc)
2710	9-3316	Phys. Rev. 97, 1077-83(1955)
2744	9-735	Dep.(mc)
2745	9-506	Dep.(mc)

Report	Abstract	Availability
UCRL		
2746	9-1689	Dep.(mc)
2747(Rev.)	9-6132	Nuovo cimento (10) 2, 707-18(1955)
2748	9-306	Nucleonics 13, No. 3, 44-6(1955); Dep.(mc)
2749	9-3314	Phys. Rev. 97, 1059-70(1955)
2753(Rev.)	9-4294	Phys. Rev. 98, 173(1955)
2754	9-736	Phys. Rev. 98, 736-40(1955)
2765	9-5534	Phys. Rev. 98, 1258-66(1955)
2766	9-4319	Phys. Rev. 98, 19-21(1955)
2768	9-3684	Phys. Rev. 97, 1255-8(1955)
2771	9-1644	Dep.(mc)
2774	9-1456	Dep.(mc)
2778	9-5807	Phys. Rev. 98, 1814-17(1955)
2779	9-3940	Proc. Soc. Expti. Biol. Med. 88, 383-6 (1955)
2781	9-2452	Phys. Rev. 97, 564-5(1955)
2782	9-5808	Phys. Rev. 98, 1817-21(1955)
2783	9-2411	Dep.; $0.25
2789	9-7107	Dep.; $0.35
2790	9-1446	Am. J. Physiol. 181, 280-6(1955); Dep.(mc)
2792	9-1477	Dep.(mc)
2793	9-1709	Proc. Soc. Exptl. Biol. Med. 87, 626-9 (1954)
2794	9-2198	J. Am. Chem. Soc. 77, 4139-42(1955)
2795	9-2465	Rev. Sci. Instr. 26, 220-8(1955); Dep.(mc)
2798	9-4320	Phys. Rev. 98, 22-3(1955)
2799	9-2914	Dep.; $0.55
2803	9-3823	J. Phys. Chem. 59, 105-9(1955)
2805	9-2890	Dep.(mc)
2806	9-1645	Dep.(mc)
2806(Rev.)	9-7546	Phys. Rev. 99, 1356-66(1955)
2812	9-1712	Dep.(mc)
2813	9-1669	Dep.(mc)
2818	9-3663	Dep.
2822	9-3664	Dep.
2823	9-2551	Dep.
2827	9-3377	Biochim. et Biophys. Acta 17, 503-14(1955)
2828	9-2608	Biochim. et Biophys. Acta 17, 515-24(1955)
2832	9-3437	Dep.(mc)
2833	9-2929	Dep.
2836	9-2540	Proc. Soc. Exptl. Biol. Med. 88, 73-5 (1955); Dep.(mc)
2837	9-2195	Dep.
2841	9-2136	Dep.
2843	9-2930	Dep.
2845	9-3364	Radiation Research 3, 88-104(1955)
2846	9-3357	Biochim. et Biophys. Acta 17, 332-40(1955)
2849	9-5304	Dep.
2852	9-6122	Phys. Rev. 99, 42-7(1955)
2853	9-3048	Dep.
2854	9-2137	Dep.
2857	9-3009	Dep.

Report	Abstract	Availability
UCRL		
2858	9-3954	Phys. Rev. 99, 1509-14(1955)
2859	9-3089	Rev. Sci. Instr. 26, 616(1955)
2860	9-2609	Dep.
2862	9-3071	Dep.
2865	9-3253	Rev. Sci. Instr. 26, 696-7(1955)
2868	9-4607	Phys. Rev. 98, 840-2(1955)
2877	9-6033	Phys. Rev. 99, 333-4(1955)
2881	9-3730	Dep.
2885	9-5586	Dep.
2888	9-4704	Dep.
2916	9-5308	Phys. Rev. 98, 1521-3(1955)
2917	9-7946	IRE Convention Record 3, Part 10, 199-203 (1955)
2918	9-7173	Phys. Rev. 99, 890-2(1955)
2919	9-7174	Phys. Rev. 99, 892-5(1955)
2920	9-3966	Dep.
2924	9-4363	Dep.
2925	9-6378	Dep.
2926	9-4742	Dep.
2927	9-6379	Dep.
2928	9-4517	Dep.
2929	9-3778	Dep.
2930	9-4212	Dep.(mc)
2932	9-4705	Dep.
2933	9-4929	Dep.
2934	9-4973	Dep.
2935	9-6416	Rev. Sci. Instr. 26, 728-9(1955)
2941	9-7653	Dep.
2942	9-5587	Dep.
2943	9-5306	Phys. Rev. 98, 1518-19(1955)
2944	9-5307	Phys. Rev. 98, 1519-20(1955)
2946	9-4499	Dep.
2948	9-4726	Dep.
2949	9-5289	J. Am. Chem. Soc. 77, 5357-9(1955)
2952	9-6061	Phys. Rev. 99, 337(1955)
2953	9-4859	Dep.
2954	9-5509	Dep.
2955	9-4872	Dep.(mc)
2956	9-4873	Dep.
2963	9-6024	Phys. Rev. 99, 335-6(1955)
2965	9-7128	Phys. Rev. 99, 764-70(1955)
2967	9-6059	Phys. Rev. 99, 332-3(1955)
2968	9-5167	Dep.
2970	9-4863	Dep.(mc)
2971	9-5303	Dep.
2972	9-7140	Phys. Rev. 99, 1044-5(1955)
2973	9-6023	Phys. Rev. 99, 329-30(1955)
2974	9-4864	Dep.(mc)
2975	9-4885	Dep.
2979	9-4860	Phys. Rev. 99, 1049-50(1955) (Condensed)
2983	9-5933	Dep.
2985	9-5114	Dep.
2987	9-5210	Dep.
2988	9-6334	Dep.
2989	9-5407	Dep.
2990	9-5115	Dep.
2992	9-5079	Dep.
2993	9-5569	Proc. Natl. Acad. Sci. U. S. 41, 563-71(19
2994	9-6710	Dep.
2995	9-4912	Geriatrics 10, 349-54(1955)
2996	9-5116	Dep.
2998	9-7089	Phys. Rev. 99, 1042-3(1955)
3001	9-5080	Dep.
3003	9-5450	Dep.
3010	9-5510	Dep.
3011	9-6880	Dep.; OTS
3012	9-6069	Dep.
3013	9-5571	Dep.
3014	9-6035	Dep.
3015	9-5839	Dep.
3020	9-5835	Dep.
3031	9-5129	Dep.(mc)
3032	9-6219	Dep.
3035	9-7642	Dep.
3036	9-7143	Phys. Rev. 99, 1048-9(1955)
3037	9-5627	Dep.
3038	9-6511	Dep.
3042	9-7480	Phys. Rev. 99, 1619-20(1955)
3045	9-7167	Dep.
3046	9-6094	Dep.
3051	9-7675	Dep.(mc)
3055	9-7231	Dep.
3056	9-7446	Dep.(mc)
3061	9-6784	Dep.
3062	9-7433	Dep.
3063	9-6863	Dep.
3064	9-7479	Phys. Rev. 99, 1617-18(1955)
3065	9-7063	Dep.
3066	9-7654	Dep.
3067	9-7589	Phys. Rev. 99, 1572-3(1955)
3068	9-7272	Dep.(mc)
3078	9-6563	Dep.
3081	9-6900	Dep.
3085	9-7606	Dep.
3088	9-6911	Dep.

Report	Abstract	Availability
UCRL		
3096	9-7232	Dep.
3102	9-7824	Dep.
3104	9-7185	Dep.(mc)
3112	9-7418	Dep.
3114	9-7903	Dep.
3116	9-7676	Dep.
4148	9-4386	Dep.
4319	9-1320	Nucleonics 12, No. 3, 26-7(1954)
4371	9-4286	Dep.(mc)
4377	9-2634	Dep.
4379	9-4300	Dep.(mc)
4386(Rev.)	9-3021	Phys. Rev. 97, 242(1955)
4391	9-6073	Phys. Rev. 99, 183(1955)
4400	9-4280	Phys. Rev. 98, 42(1955)
4408	9-6075	Phys. Rev. 99, 288-9(1955)
4411	9-6621	J. Phys. Chem. 59, 690-5(1955)
4426	9-2218	J. Am. Chem. Soc. 77, 4958-60(1955)
4432	9-3055	Dep.
4433	9-4025	Dep.
4435	9-4645	Phys. Rev. 98, 783-7(1955)
4436	9-2474	Dep.
4459	9-3446	Dep.
4462	9-6335	Dep.
4465	9-4246	Dep.(mc)
4472	9-4413	Dep.
4474	9-3936	Dep.
4476	9-4509	Dep.(mc)
4485	9-4843	Dep.(mc)
4496	9-5280	Dep.; $0.15
4497	9-4763	Dep.(mc)
4503	9-5391	Dep.(mc)
4504	9-5249	Dep.
4507	9-7098	Dep.
4508	9-6665	Dep.
4513	9-6881	Dep.
4519	9-7273	Dep.
4527	9-6599	Dep.
4533	9-7455	Dep.
4536	9-7071	Dep.
4554	9-7856	Dep.
UCRL-Trans		
434(L)	9-5453	LC
533(L)	9-5980	LC
533(L)	9-5452	LC
537(L)	9-7050	LC
USF		
0	9-1723	Dep.
1	9-6155	Dep.

Report	Abstract	Availability
UR		
280	9-1731	Arch. Ind. Health 11, 11-16(1955)
307	9-1728	Dep.
308	9-4048	Dep.
310	9-4049	Dep.
327	9-19	Dep.
354	9-481	Dep.
355	9-1157	Dep.
363	9-62	Dep.
365	9-847	Dep.
367	9-916	Dep.
376	9-1705	Dep.
377	9-5936	Dep.
379	9-3010	Dep.
380	9-2521	Dep.
382	9-4692	Dep.
384	9-4050	Dep.
385	9-4045	Dep.
386	9-5211	Dep.
387	9-5383	Dep.
388	9-5572	Dep.
390	9-4076	Am. Ind. Hyg. Assoc. Quart. 16, 215-20(1955); Dep.
392	9-4055	Dep.
393	9-5583	Dep.
394	9-5212	Dep.
395	9-5584	Dep.
396	9-5874	Dep.
398	9-5840	Dep.
401	9-5841	Dep.
402	9-5863	Dep.
Visit No.		
316	9-4976	See WASH-527
WAPD-ReS		
13	9-429	Dep.(mc)
WAPD-RM		
159	9-2742	Dep.
213	9-779	Dep.; $0.55
WAPD-T		
170	9-1656	Dep.(mc)
WASH		
182	9-659	Dep.; $0.70
183	9-79	Dep.; $0.20
292(Pt.3)	9-7957	Dep.; $0.45
512	9-3098	Dep.
527	9-4976	Dep.
WIN		
7	9-2635	Dep.(mc)
10	9-3779	Anal. Chem. 27, 1839-41(1955)

Report	Abstract	Availability
WIN		
16	9-7728	Dep.(mc);
19	9-5250	Dep.(mc)
20	9-7275	Dep.(mc)
XDC		
54-1-13	9-4986	See APEX-186
54-4-12	9-2700	See APEX-179
Y		
577	9-1955	Dep.; $0.25
623	9-1956	Dep.; $0.25
Y		
628	9-1591	Dep.; $0.25
669	9-1592	Dep.; $0.25
671	9-1957	Dep.; $0.20
692	9-1593	Dep.; $0.25
693	9-1312	Dep.; $0.25
779	9-2406	Dep.; $0.25
813	9-2839	Dep.; $0.25
884	9-7310	Dep.; $0.15
893	9-7297	Dep.; $0.10
900	9-7696	Dep.; $0.15
958(1953 Suppl.)	9-1961	Dep.

NON-AEC REPORTS

A		
55-1(PU)	9-6703	
ACSIL/Liby (British)		
4	9-7820	
9	9-2237	
AD		
167	9-1529	See ATI-161851
221	9-964	See AD-29006
222	9-965	See AD-29007
223	9-3856	See AD-43830
1292	9-3809	
2163	9-4808	See WADC-TR-52-232
3245	9-1820	See WADC-TR-52-67
4479	9-3775	
5397	9-3840	
5752	9-4990	
5787	9-3081	
6354	9-7746	See WADC-TR-52-252
6374	9-2847	
6512	9-2848	
6685	9-3841	
6916	9-4126	
7111	9-6956	See WADC-TR-53-5
7151	9-4241	
7152	9-4242	
7360	9-2632	See MR-538
7610	9-5061	See WADC-TR-52-307(Pt 1)
7882	9-4787	
7950	9-4942	See MR-524
8941	9-3842	
9065	9-4215	
9828	9-3922	
9935	9-3069	See MLRR-170
10193	9-3546	
10278	9-3163	
10555	9-3475	
AD		
10803	9-3362	See NM-001.059.13.05
10920	9-3407	
11048	9-3476	
11550	9-5599	See CI/R-72
11745	9-4243	
12019	9-3868	See WADC-TR-53-84
12123	9-2849	
12451	9-3380	
12978	9-3455	
13819	9-3477	
13866	9-5652	
14076	9-2820	
15741	9-3182	See WADC-TR-52-51(Pt. 2)
15788	9-3051	
15789	9-3207	
15918	9-3478	
15919	9-3479	
15926	9-3518	See WADC-TR-53-101
15991	9-3696	
16020	9-2677	
16225	9-3993	
16317	9-2716	
16386	9-3480	
16551	9-3843	
16978	9-3888	
17020	9-3844	
17410	9-3994	
17929	9-2657	
18056	9-3845	
18061	9-1282	
18278	9-6205	
18569	9-5074	
18652	9-3481	
18993	9-3482	
19228	9-2717	
19236	9-2895	
19447	9-3483	
19590	9-2412	

Report	Abstract	Availability
AD		
19017	9-3968	
21020	9-3846	
21076	9-3847	
22087	9-2718	
22321	9-5653	
22410	9-2825	
22854	9-3848	
22879	9-84	Anal. Chim. Acta 11, 350-8(1954)
22885	9-3484	
22921	9-3394	
22922	9-266	
22977	9-2296	See WADC-TR-53-71
23169	9-5898	See WADC-TR-52-191(Pt.2)
23384	9-3459	See EES-040028B
23385	9-3824	See EES-040009
23431	9-2703	
23498	9-3859	See EES-040029C
23657	9-2228	See WADC-TR-53-184
23715	9-3521	See WADC-TR-53-336(Pt. 1)
24017	9-3519	See WADC-TR-53-151(Suppl. 1)
24127	9-4840	
24308	9-3510	See NAVORD-2072
24478	9-3509	See MR-582
24936	9-2785	
25023	9-2850	See NML-5115-B-19.15(pt. 3)
25101	9-3485	
25190	9-3622	
25526	9-3865	See RL-1009
25802	9-3849	
25946	9-75	See JPL-PR-20-205
25947	9-3486	
25959	9-3487	
26029	9-3386	See WADC-TR-53-308(Pt. 1.)
26044	9-2273	
26137	9-3488	
26352	9-3869	See WADC-TR-53-274
26498	9-267	
26512	9-2719	
26534	9-3489	
26622	9-3520	See WADC-TR-53-182
26731	9-2274	
26735	9-3490	
26783	9-3164	
26788	9-5340	
27052	9-3491	
27310	9-4453	See NAVORD-2073
27424	9-2945	
27560	9-3872	See YE54-530
27583	9-3522	See WADC-TR-53-451
27589	9-2335	See WADC-TR-53-211
27621	9-6369	
27727	9-3578	See WADC-TR-53-194
27884	9-2720	
27942	9-6279	
28049	9-5976	See WCRT-TN-54-32
28234	9-3889	
28235	9-4958	
28253	9-1836	
28277	9-3492	
28372	9-3805	
28428	9-3806	
28429	9-2786	
28436	9-947	
28462	9-1527	
28528	9-4204	
28580	9-5341	
28620	9-693	
28641	9-961	
28656	9-4807	See WAD-1774
28819	9-962	
28821	9-147	See RIA-54-24
28855	9-167	
28877	9-3165	
28908	9-963	
28937	9-2721	
29006	9-964	
29007	9-965	
29189	9-2130	
29337	9-348	
29379	9-974	See WADC-TR-54-17
29396	9-2740	See WADC-TR-53-190(Pt. 2)
29400	9-4182	See WADC-TR-53-502
29415	9-4991	
29436	9-191	See WADC-TR-52-51(Pt. 3)
29642	9-1237	
29764	9-4107	
29824	9-5957	See MR-556
29826	9-4461	See WADC-TR-54-87
30109	9-5814	
30192	9-650	See HE-150-118
30314	9-3493	
30491	9-4226	
30560	9-5663	See WADC-TR-52-322(Pt.2)
30562	9-3873	YE54-541
30732	9-3208	
30744	9-3511	See NOTS-TM-789
30757	9-4788	
30797	9-3850	
30810	9-1738	
31146	9-268	
31584	9-1263	
31826	9-1837	
31842	9-5095	
31854	9-1838	
31954	9-1839	
32009	9-168	
32031	9-1840	
32084	9-5654	
32191	9-1841	
32192	9-1842	
32193	9-1843	
32194	9-1844	
32210	9-5992	See WAL-142/59
32275	9-4992	
32604	9-1578	
32605	9-1579	
32611	9-1912	
32652	9-3503	See CAL-KB-856-M-6

Report	Abstract	Availability
AD		
32661	9-4971	
32731	9-2297	See WADC-TR-53-254(Pt. 1)
32986	9-1845	
33305	9-3216	See PA-TR-1898
33442	9-2722	
33540	9-1846	
33675	9-3494	
33840	9-2275	
33893	9-3720	
33957	9-5937	
34004	9-1789	
34029	9-6105	See ER-6119
34141	9-5643	See WADC-TR-54-13
34358	9-4157	
34359	9-4158	
34360	9-1847	
34417	9-3523	See WADC-TR-53-88
34434	9-4159	
34449	9-1848	
34485	9-2829	See NP-3822(Add. 1)
34506	9-3814	
34672	9-5938	See NGTE-M-178
34712	9-1849	
34897	9-3115	See RIA-54-849
34924	9-3851	
34974	9-3250	
34999	9-3126	See NAVORD-2958
35043	9-4160	
35044	9-4161	
35044-A	9-3852	
35092	9-3495	
35105	9-3853	
35109	9-3854	
35134	9-3496	
35249	9-6062	
35265	9-5952	
35278	9-7782	
35289	9-5953	
35353	9-4057	
35356	9-4094	
35942	9-4058	
36555	9-4130	See M-TR-10
36788	9-4211	See PIBAL-216
36827	9-5342	
36889	9-2612	
36906-A	9-5050	
36906-B	9-5051	
37128	9-4489	
37130	9-4127	
37226	9-4162	
37293	9-4163	
37294	9-4164	
37295	9-4165	
37311	9-4166	
37321	9-4188	See WAL-801/6-25
37702	9-4183	See WADC-TR-53-503
37801	9-4088	
37803	9-5149	See NCSC-72
38003	9-4137	
38005	9-4789	
38048	9-4790	
38093	9-4964	See WADC-TR-54-70
38202	9-7790	See WCRT-TN-53-178
38231	9-4184	See WADC-TR-54-40
38580	9-4418	
38656	9-4807	
38719	9-4793	See CAL-KD-752-M-4
38787	9-4345	
38791	9-4143	
38811	9-6639	
38847	9-4802	See RAE-TN-MET-197
38860	9-4299	
38918	9-4791	
39432	9-4930	See ORDTX-10
39644	9-4830	See AFCRC-TR-54-257
39796	9-4841	See CARDE-291/53
40019	9-1808	See RAE-TN-EL-68
40171	9-2381	See CX-14
40234	9-1850	
40252	9-2885	
40272	9-2276	
40736	9-2277	
40737	9-2278	
40917	9-1803	
40935	9-2281	See JPL-PR-20-212
41436	9-2695	See OSR-TN-54-203
41478	9-3855	
41800	9-3497	
41950	9-4041	
42310	9-3795	
42380	9-2299	See WAL-401/216
42465	9-2354	
42466	9-2355	
42467	9-2356	
42468	9-2357	
42694	9-2650	
42703	9-4123	See PI-323
42776	9-3140	
42797	9-3275	See OSR-TN-52-81
43132	9-3547	
43150	9-2160	
43232	9-2279	
43697	9-4168	See COA-84
43739	9-3153	
43830	9-3856	
44180	9-3498	
44196	9-3068	See DTMB-867
44201	9-3500	See AML-NAM-AE-4146
44256	9-3166	
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44543	9-3178	See PA-TR-2061
44577	9-3904	
44599	9-2741	See WADC-TR-53-496
44632	9-3434	
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44668	9-3345	See AMRL-138
44719	9-3209	
44789	9-3585	

Report	Abstract	Availability
AD		
44790	9-3586	
44804	9-6640	
44848	9-3504	See CAL-KB-836-M-7
44847	9-3502	See CAL-KA-797-M-12
45580	9-7786	See WADC-TR-54-175(Pt. 1)
45710	9-3857	
45886	9-3761	
45943	9-4193	See AERE-Trans-11/3/5/253
45993	9-4419	See WADC-TR-53-293(Pt.5)
46020	9-4138	
46196	9-3918	
46197	9-3919	
46232	9-4114	
47231	9-4778	See PA-TR-2092
47377	9-5361	See WADC-TR-54-270(Pt. 1)
47751	9-3810	
47796	9-4939	
47919	9-3548	
47926	9-5343	
47976	9-5344	
48047	9-5345	
48049	9-5418	
48095	9-3549	
48178	9-5354	See MS-PR-54-46
48534	9-7581	
48846	9-2886	
49029	9-5062	See WADC-TR-53-336(Pt.3)
49099	9-5664	See WADC-TR-53-336(Pt.2)
49133	9-1775	See OSR-TN-54-238
49318	9-4869	
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49409	9-5346	
49670	9-5656	See NAA-AL-2064
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50022	9-7958	
50389	9-7431	See RAE-TN-INSTN-142
50934	9-7694	See RAE-MET-79
51222	9-4813	See WADC-TR-54-305
51362	9-3550	
51655	9-6196	See WCLP-TN-54-235
51831	9-4139	
52022	9-6951	
52428	9-6645	
52543	9-6866	
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1578	9-4206	
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473	9-3448	
474	9-1786	
475	9-3781	
476	9-3429	
477	9-2231	
479	9-4133	
480	9-4850	
481	9-3361	
485	9-3454	
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Report	Abstract	Availability
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515	9-6096	
516	9-5966	
519	9-7043	
520	9-4093	
523	9-4709	
524	9-6648	
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526	9-6887	
527	9-6909	
530	9-7730	
534	9-7419	
535	9-7299	
537	9-6167	
539	9-7280	
540	9-4851	See AEC-tr-2130(p.3-4)
541	9-4886	See AEC-tr-2130(p.5-7)
542	9-4887	See AEC-tr-2130(p.8-11)
543	9-4888	See AEC-tr-2130(p.12-16)
544	9-4889	See AEC-tr-2130(p.17-20)
545	9-4890	See AEC-tr-2130(p.21-3)
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554	9-7225	
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11/3/5/537	9-6167	See AERE-Lib/Trans-537
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AERE-X/M (British)

Report	Abstract	Availability
AERE-X/R (British)		
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AF-SAM		
55-40	9-6562	
AF-TR		
6516(Pt. 2)	9-1528	
AFCRC-TR (Non-AEC)		
257	9-4830	
AFSWP		
480	9-234	See USNRDL-417
736	9-4913	See USNRDL-TR-45
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162	9-1710	
167	9-4664	
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170	9-5570	
174	9-4690	
175	9-4043	
178	9-4357	
180	9-4679	
195	9-6565	
198	9-6824	
200	9-7610	
202	9-7229	
207	9-7230	
209	9-7693	
ARC (British)		
854	9-4840	See AD-24127
16679	9-4764	
ARDC.P (British)		
139	9-7295	See RDB(C)/TN-138
ASL-NAM-AD		
298.1(Pt.1)	9-7430	See NP-5761
ATI		
9167	9-1851	
58116	9-615	
58193	9-938	
58194	9-616	
103581	9-1894	
110138	9-2828	See NP-3822
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143770	9-1852	
150135	9-3181	See WADC-TR-52-51(Pt. 1)
153687	9-3129	
154254	9-3167	See CAL-455-M-6
160108	9-6543	
161851	9-1529	
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168642	9-3923	See CRLIR-158
169195	9-3726	See NM-001-059.13.04
171112	9-968	
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173232	9-1853	
208130	9-1041	See U-13876
208182	9-941	See EES-6C10730
AWRE (British)		
0-65/54	9-5886	
AWRE-O (British)		
11/55	9-6352	
13/55	9-6373	
14/54	9-2631	
15/55	9-6260	
19/55	9-6374	
73/54	9-4948	
74/54	9-6637	
BLIR		
1	9-4488	
BM-IC		
7723	9-6283	
7726	9-7332	
BM-RI		
5093	9-1895	
5107	9-2724	
5117	9-3858	
5144	9-6660	
5149	9-7344	
BMI		
1006	9-5655	

Report	Abstract	Availability
BL-Memo		
819	9-1018	
830	9-4765	
890	9-6375	
CAL		
455-M-6	9-3167	
CAL-KA		
797-M-12	9-3502	
CAL-KB		
836-M-6	9-3503	
836-M-7	9-3504	
914-M-2	9-3505	
914-M-3	9-3506	
CAL-KD (Non-AEC)		
752-M-4	9-4793	
CAP-TM		
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CARDE (Canadian)		
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1024-TR-55	9-98	
1024-TR-58	9-52	
1024-TR-78	9-506	
1024-TR-81	9-2161	
1024-TR-85	9-2131	
1024-TR-86	9-2132	
1024-TR-87	9-2679	
1024-TR-90	9-2613	
1024-TR-93	9-4059	
1024-TR-96	9-3756	
1024-TR-99	9-4378	
1024-TR-102	9-4379	
1024-TR-103	9-4940	
1024-TR-104	9-4972	
1024-TR-121	9-5873	
1024-TR-129	9-6869	
1024-TR-132	9-6870	
1024-TR-133	9-6871	
1024-TR-137	9-7671	
CCL		
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CEA (French)		
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338	9-7902	
345	9-6962	
352	9-6993	
360	9-7021	
368	9-7044	
CERN (European)		
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55-2	9-4660	
55-3	9-3306	
55-11	9-7202	
55-13	9-4606	Phys. Rev. 98, 775-9(1955)
55-21	9-6136	See NP-5658
CERN-BS (European)		
16	9-2414	
19	9-4539	
20	9-4513	
22	9-7069	
CERN-PS/CS (European)		
10	9-7162	
13	9-7163	
CERN-PS/ER (European)		
39	9-388	
40	9-3661	
41	9-2495	
CERN-PS/FG (European)		
1	9-1098	
CERN-PS/GL (European)		
13	9-389	
CERN-PS/JBA-MGNH (European)		
23	9-390	
CERN-PS/KJ (European)		
14	9-1099	
16	9-1100	
17	9-1101	
28	9-6493	
29	9-7164	

Report	Abstract	Availability
CERN-PS/MM (European)		
5	9-391	
6	9-770	
7	9-1367	
8	9-1652	
9	9-2923	
10	9-4296	
11	9-4297	
12	9-4580	
13	9-4581	
14	9-5162	
15	9-5163	
16	9-6084	
17	9-6085	
18	9-6494	
19	9-7557	
CERN/PS/PD (European)		
3	9-3577	
4	9-6376	
CERN-PS/PL (European)		
1	9-771	
2	9-4478	
3	9-4582	
4	9-5164	
CERN-PS/RGb (European)		
5	9-353	
6	9-392	
7	9-4298	
CERN-PS/RH (European)		
8	9-7165	
CERN/T/A-A-B-M (European)		
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CERN/T/AET (European)		
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2	9-2457	
3	9-2458	
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CERN/T/AIE (European)		
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CERN/T/CM (European)		
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CERN-T/GL (European)		
3	9-2462	
5	9-2528	
CERN/T/JH (European)		
1	9-2433	
CERN/T/KA (European)		
1	9-2529	
CERN/T/LM (European)		
2	9-2530	
CERN/T/NMH (European)		
1	9-2531	
CERN/T/OKH (European)		
1	9-2503	
CERN/T/RH (European)		
1	9-2532	
CERN/T/TS (European)		
2	9-2463	
3	9-2464	
CF (North American Aviation, Inc.)		
1038	9-3450	See NAA-AL-[illegible]
CI/R (British)		
72	9-5509	
COA (British)		
84	9-4168	
CR-HP (Canadian)		
577	9-6686	$0.25
CRCE (Canadian)		
501	9-2405	$0.25
607	9-7921	
CRDC (Canadian)		
596	9-6477	
CREL (Canadian)		
597	9-6705	
CRLR		
158	9-3923	
218	9-5722	
CRLR (Non-AEC)		
479	9-4884	
CRNE		
496	9-6921	
CRP (Canadian)		
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Report	Abstract	Availability
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CRT (Canadian)		
565	9-4490	$0.50
566	9-346	$1.00
580	9-812	$0.50
609	9-7493	
CTS (British)		
63	9-4773	Dept. of Scientific and Industrial Research, Charles House, 5-11 Regent St., London SW-1, England. $13.75
CU		
2-53-ONR-266(10)-CE	9-5937	See AD-33957
3-55-ORD-1061-IE	9-5056	See NP-5660
4-55-ORD-1061-IE)	9-7391	See NP-5764
7-55-AF-899-Met.	9-4460	See OSR-TN-54-359
8-54-SC-42519-Phys.	9-731	See NP-5421
9-55-AF-962-EE	9-7445	See OSR-TN-261
10-55-SC-42519-Phys.	9-6437	See NP-5714
11-55-SC-42519-Phys.	9-6807	See NP-5732
CVAC		
170T	9-6093	
196T	9-2027	
211T	9-2028	
212T	9-2029	
219T	9-2030	
229T	9-6063	
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245T	9-2926	
251T	9-1103	
255T	9-3924	
258T	9-1104	
262T	9-3252	
263T	9-1316	
266T	9-1375	
CX		
14	9-2381	
D		
12345	9-4116	
14839	9-4228	
DDC/P (British)		
84	9-3583	See RDB(Cap)/R-8095
102	9-3584	See RDB(Cap)/R-8108
DDC/P (British)		
107	9-3570	See RBD(Cap)/TN-127
DEV		
902	9-6641	
DF		
52TL158	9-6662	
DL (Canadian)		
16	9-3714	$0.25
17	9-5203	$0.50
18	9-4908	$0.25
DRNL-TP		
22	9-1581	
DTMB		
802	9-6244	
863	9-3439	
867	9-3068	
EES		
040009	9-3824	
040028B	9-3459	
040028K	9-4782	
040029C	9-3859	
040038F(3)	9-3145	
040038F(6)	9-3168	
040038F(7)	9-6947	
040038F(8)	9-3169	
040038F(9)	9-6948	
040038F(10)	9-5947	
060068A	9-1264	
6C101730	9-941	
9C(2)966861	9-3860	
9C(3)966861	9-3507	
9C(4)966861	9-2280	
EMC/P (British)		
34	9-3514	See RDB(W)/TN-186
37	9-3515	See RDB(W)/TN-181
ER (Non-AEC)		
6119	9-6105	
ERI		
1993-16-F	9-7346	
2076-5-P	9-7783	
ETF		
760.92-2/3	9-1798	See NP-5485
760.92-2/4	9-1799	See NP-5486
760.92-2/5	9-1800	See NP-5487
760.92-2/6	9-1801	See NP-5488
760.92-2/Final	9-1802	See NP-5489
760-274/Final	9-1984	See NP-5499

Report	Abstract	Availability
F		
2350	9-3174	See NP-5554
F-TS		
713-RE	9-3129	See ATI-153687
7335-RE	9-6361	See ATI-142948
8030 A/V	9-4143	See AD-38791
FM		
1527b	9-4764	See ARC-16679
FWE		
10	9-35	
19	9-4659	
31	9-2415	
FZA (Non-AEC)		
9-250	9-6063	See CVAC-229T
FZK		
9-051	9-6093	See CVAC-170T
9-082	9-6500	See CVAC-243T
9-089	9-6508	See NARF-55-55T(Vol.1, Pts. 1 and 2)
G		
17-53	9-3843	See AD-16551
17-62	9-1838	See AD-31854
17-63	9-1847	See AD-34369
GPI (Canadian)		
17	9-5108	
GPR (Canadian)		
1/55	9-4996	
2/55	9-6650	
4/54	9-2260	
HE		
150-86	9-4430	
150-107	9-4431	
150-118	9-650	
150-124	9-4230	
HEPL		
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IER		
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IG-Trans-(R)		
3	9-4434	
IMM-NYU		
216	9-4238	
IOP (Canadian)		
3	9-7923	
ITL		
4135	9-3508	
JENER (Norwegian)		
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35	9-4235	
36	9-6898	
JENER-Pub. (Norwegian)		
8	9-899	
JPL-Memo		
20-88	9-4129	
JPL-PR		
20-172	9-630	
20-205	9-75	
20-212	9-2281	
K (Cal. Tech)		
3.3	9-4208	See NP-5578
LE (Canadian)		
36	9-6402	$0.25
M-TR		
10	9-4130	
MAB		
97-M	9-7347	
MCC		
1023-TR-34	9-515	
1023-TR-66	9-1763	
1023-TR-67	9-3891	
1023-TR-73	9-516	
1023-TR-75	9-597	
1023-TR-79	9-1741	
1023-TR-80	9-598	
1023-TR-82	9-1742	
1023-TR-98	9-2614	
1023-TR-99	9-2615	
1023-TR-104	9-4697	
1023-TR-116	9-4698	
1023-TR-117	9-4380	
1023-TR-118	9-7259	
1023-TR-119	9-4699	
1023-TR-120	9-4412	
1023-TR-121	9-4700	
1023-TR-129	9-5909	
1023-TR-135	9-7260	
1023-TR-136	9-7261	

Report	Abstract	Availability
MCC		
1023-TR-137	9-7262	
1023-TR-138	9-7263	
1023-TR-148	9-7264	
1023-TR-149	9-7265	
MET.I. (Canadian)		
3	9-2252	
MLCR		
37	9-47	
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43	9-914	
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53	9-3360	
MLM		
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MLRR		
170	9-3069	
351	9-4054	
MLSR		
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MR		
534	9-4942	
538	9-2632	
556	9-5957	
573	9-84	See AD-22879
582	9-3509	
MR-A		
318	9-2030	See CVAC-219T
319	9-1104	See CVAC-258T
336	9-2027	See CVAC-198T
342(Rev.)	9-1103	See CVAC-251T
MR-N		
1	9-2029	See CVAC-212T
5	9-2028	See CVAC-211T
25	9-2926	See CVAC-245T
34	9-3924	See CVAC-255T
47	9-1316	See CVAC-263T
50	9-3252	See CVAC-262T
54	9-1375	See CVAC-266T
77	9-7853	See NARF-55-12T
94	9-6403	See NARF-55-44T
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Report	Abstract	Availability
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2064	9-5656	
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E54F11	9-5633	
L9B28	9-4766	
NACA-RM-E		
50F22	9-1248	
52A17	9-1249	
52B06	9-1250	
52D09	9-1251	
52F30	9-1805	
54D13	9-4140	
54H04	9-1105	
54K10	9-4131	
54L10	9-4342	
NACA-RM-L		
55E12B	9-5960	
NACA-TM		
982	9-1818	
1078	9-6249	
1113	9-1014	
1137	9-4774	
1308	9-4134	
1330	9-7402	
1390	9-5942	
NACA-TN		
1713	9-4767	
2717	9-651	
2783	9-4432	
2838	9-4061	
3045	9-4132	
3141	9-2229	
3212	9-7739	
3214	9-5635	
3216	9-4170	
3264	9-2693	
3266	9-2694	
3270	9-7840	
3281	9-2706	
3282	9-3826	
3291	9-173	
3293	9-6995	
3296	9-4768	
3333	9-4142	
3334	9-5636	
3336	9-3125	
3337	9-1813	
3351	9-3863	
3380	9-3171	
3392	9-3915	
3397	9-4767	
3402	9-4979	
3412	9-5356	See NBS-3273
3444	9-4794	
3450	9-5355	

Report	Abstract	Availability
NACA-TN		
3451	9-4433	
3493	9-6996	
3511	9-5716	
3513	9-7348	
NARF		
55-12T	9-7853	
55-44T	9-6403	
55-55T(Vol.1, Pts. 1 and 2)	9-6508	
NAVORD		
2072	9-3510	
2073	9-4453	
2958	9-3126	
3803	9-1318	
NBL (Canadian)		
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3130	9-77	
3273	9-5356	
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NDA		
10-96	9-2447	
15C-42	9-6029	See NYO-6267
15C-60	9-6030	See NYO-6269
27-39	9-3977	
NEI (Canadian)		
22	9-4171	
NEPA		
1020	9-174	
1798	9-600	
NGTE-M		
178	9-5938	

Report	Abstract	Availability
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NOTS-TM		
789	9-3511	
NP (AEC File No. for Non AEC Reports)		
1959	9-116	
3822	9-2828	
3822(Add.1)	9-2829	
4149(2nd Ed., Rev.)	9-2851	
4859(Suppl. 5)	9-1552	
4859(Suppl. 6)	9-7023	
5023	9-55	
5024	9-2134	
5025	9-6595	
5295	9-939	
5295(Suppl. 1)	9-632	
5329	9-13	
5333	9-14	
5336	9-142	
5355	9-175	
5356	9-341	
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5362	9-231	
5364	9-150	
5366	9-15	
5367	9-232	
5368	9-176	
5369	9-177	
5371	9-4	
5372	9-699	
5374	9-178	
5376	9-56	
5377	9-179	
5378	9-517	
5379	9-180	
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5405	9-342	
5406	9-393	
5407	9-183	

Report	Abstract	Availability
NP (AEC File No. for Non-AEC Reports)		
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5409	9-184	
5411	9-16	
5412	9-478	
5413	9-479	
5414	9-877	
5415	9-518	
5416	9-519	
5417	9-605	
5418	9-721	
5419	9-480	
5420	9-633	
5421	9-731	
5422	9-634	
5423	9-935	
5424	9-520	
5425	9-521	
5427	9-652	
5429	9-1134	
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5434	9-1139	
5435	9-1071	Phys. Rev. 97, 1191-9(1955) (Condensed)
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5453	9-1502	
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5470	9-1855	
5471	9-1743	
5472	9-1720	
5473	9-1856	
5474	9-1857	
5475	9-1944	
5477	9-1897	
5478	9-1898	
5479	9-1899	
5480	9-1900	
5481	9-1901	
5482	9-1902	
5483	9-1903	
5484	9-1904	
5485	9-1798	
5486	9-1799	
5487	9-1800	
5488	9-1801	
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5501	9-2282	
5502	9-1859	
5503	9-2471	
5504	9-2103	
5505	9-1784	
5506	9-3978	

Report	Abstract	Availability
NP (AEC File No. for Non-AEC Reports)		
5507	9-2283	
5508	9-2242	
5509	9-2261	
5510	9-2284	
5511	9-2109	
5513	9-2384	
5514	9-2285	
5515	9-2360	
5516	9-2110	
5518	9-2286	
5519	9-2287	
5520	9-2288	
5521	9-2289	
5522	9-2290	
5523	9-2291	
5524	9-2292	
5526	9-2548	
5527	9-2808	
5528	9-2727	
5529	9-2293	
5530	9-2728	
5531	9-2729	
5532	9-2790	
5533	9-2791	
5534	9-2830	
5535	9-2730	
5538	9-2690	
5539	9-2731	
5540	9-2732	
5541	9-2733	
5542	9-2792	
5543	9-2549	
5544	9-2852	
5545	9-2707	
5546	9-2853	
5547	9-2913	
5548	9-2928	
5549	9-3172	
5551	9-3083	
5552	9-3173	
5554	9-3174	
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5580	9-3758	
5581	9-3759	
5583	9-3827	
5584	9-3727	
5586	9-3728	
5587	9-3729	
5588	9-3717	
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5592	9-4332	
5593	9-4172	
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5595	9-4091	
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Report	Abstract	Availability
NP (AEC File No. for Non-AEC Reports)		
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5604	9-4176	
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5611	9-4178	
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5613	9-4122	
5614	9-4179	
5615	9-4333	
5616	9-4210	
5618	9-4239	
5621	9-4366	
5622	9-4479	
5624	9-4480	
5625	9-4515	
5629	9-4454	
5630	9-4516	
5631	9-4455	
5632	9-4456	
5633	9-4795	
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5637	9-4798	
5638	9-4799	
5639	9-4800	
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5644	9-4770	
5645	9-4665	
5648	9-4801	
5650	9-4993	
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5668	9-5077	
5670	9-4989	
5672	9-5057	
5673	9-5622	

Report	Abstract	Availability
NP (AEC File No. for Non-AEC Reports)		
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5685	9-5247	
5687	9-5359	
5688	9-5323	
5689	9-5318	
5690	9-5657	
5691	9-5658	
5692	9-5704	
5694	9-5932	
5695	9-5659	
5696	9-5626	
5697	9-5634	
5698	9-5705	
5699	9-5660	
5700	9-5782	
5701	9-5718	
5702	9-5638	
5703	9-5681	
5704	9-5910	
5705	9-5961	
5707	9-5979	
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5709	9-5962	
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5712	9-6180	
5713	9-6246	
5714	9-6437	
5715	9-6342	
5716	9-6261	
5717	9-6343	
5718	9-6209	
5719	9-6370	
5720	9-6404	
5721	9-6210	
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5724	9-6286	
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5727	9-6247	
5728	9-6181	
5730	9-6154	
5732	9-6807	
5733	9-6678	
5734	9-6679	
5735	9-6873	
5736	9-6997	
5737	9-6998	
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5739	9-6999	
5740	9-6958	
5741	9-6821	
5742	9-6931	
5743	9-6932	
5744	9-6933	

Report	Abstract	Availability
NP (AEC File No. for Non-AEC Reports)		
5745	9-6934	
5747	9-7025	
5748	9-7026	
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5750	9-7070	
5751	9-6953	
5752	9-7349	
5754	9-7454	
5755	9-6874	
5756	9-7494	
5757	9-7266	
5758	9-6826	
5760	9-7502	
5761	9-7430	
5762	9-7293	
5763	9-7294	
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5765	9-7560	
5766	9-7326	
5767	9-7267	
5769	9-7350	
5772	9-7784	
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4542	9-4481	
4563	9-6348	
4597	9-6150	

Report	Abstract	Availability
NRL		
4564	9-5963	
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4569	9-6596	
4571	9-5724	
4575	9-7027	
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NRL-Memo		
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209	9-7672	
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387	9-635	
393	9-1466	
424	9-4702	
454	9-4367	
470	9-5078	
516	9-6875	
NRL-Trans		
398	9-5399	
484	9-5386	
504	9-6190	
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Report	Abstract	Availability
P		
2337-8	9-1855	See NP-5470
PA-TR		
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1988	9-3513	
2060	9-3452	
2061	9-3178	
2092	9-4778	
PD (Canadian)		
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PDB (Canadian)		
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147	9-3248	
150	9-4383	
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323	9-4123	
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216	9-4211	
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197	9-4802	
205	9-4803	
RAE-Trans (British)		
476	9-3130	
RD(R) (British)		
8134	9-5193	
8135	9-5194	
RDB(C)/TN (British)		
70	9-1206	
86	9-4180	
103	9-2666	
106	9-1745	
117	9-4181	
131	9-6182	
138	9-7295	
RDB(Cap)/R (British)		
8095	9-3583	
8108	9-3584	
8120	9-3385	
RDB(Cap)/TN (British)		
127	9-3570	
RDB(R) (British)		
8140	9-6808	
RDB(R)/TN		
36	9-2822	
RDB(W)		
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RDB(W)/TN (British)		
58	9-3746	
106	9-3777	
118	9-3933	
119	9-3934	
136	9-3760	
138	9-3815	
166	9-3514	
173	9-3864	
181	9-3515	
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RM (Misc.)

Report	Abstract	Availability
MPR (Australian)		
128	9-2409	
129	9-2410	
S		
4128	9-1197	See NP-5450
4384	9-5346	See AD-49409
13613	9-2790	See NP-5532
13624	9-2791	See NP-5533
13641	9-6679	See NP-5734
S and T Memo (British)		
6/54	9-2737	
13/54	9-2738	
14/54	9-2739	
SES-TN (Canadian)		
2	9-7432	
SP(CS)METH (British)		
9A	9-4384	
171	9-4385	
ST		
9-2900-1	9-6598	
SWP/P (British)		
20	9-7148	See AERE-RP/R-1604
T (Canadian)		
2/T	9-7445	See OSR-TN-55-261
157-R	9-4710	
TAM		
79	9-3453	
81	9-4987	
82	9-6663	
83	9-5059	
84	9-5060	
87	9-6287	
88	9-6262	
TIB/T		
4203	9-6229	
4224	9-196	
4333	9-6683	
4377	9-5887	
TML		
5A	9-7354	
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13	9-7356	Supplement to TML-5A
TN		
1021	9-4930	See ORDTX-10

Report	Abstract	Availability
TPI (Canadian)		
70	9-6502	
75	9-6399	
TR		
120/54	9-878	See NP-5439
122/54	9-5112	See NP-5665
123/54	9-2242	See NP-5508
124/54	9-2261	See NP-5509
125/54	9-1944	See NP-5475
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128/55	9-7294	See NP-5763
129/55	9-7293	See NP-5762
131/55	9-7736	See NP-5775
264-24	9-6205	See AD-18278
264-25	9-6369	See AD-27621
283-20	9-3081	See AD-5787
TT (Canadian)		
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456	9-3239	NRC
471	9-65	NRC
475	9-238	NRC
478	9-239	NRC
479	9-240	NRC
480	9-241	NRC
481	9-66	NRC
482	9-307	NRC
484	9-308	NRC
489	9-1015	NRC
491	9-674	NRC
492	9-683	NRC
499	9-1339	NRC
503	9-1419	NRC
505	9-3557	NRC
506	9-2618	NRC
507	9-2887	NRC
508	9-3571	NRC
509	9-3433	NRC
510	9-3590	NRC
516	9-4369	NRC
518	9-3572	NRC
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Report	Abstract	Availability
TT (Canadian)		
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526	9-6380	NRC
530	9-4518	NRC
531	9-4519	NRC
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534	9-4565	NRC
535	9-5202	NRC
536	9-4435	NRC
540	9-7495	NRC
541	9-7300	NRC
542	9-7584	NRC
543	9-5196	NRC
544	9-5197	NRC
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547	9-7281	NRC
548	9-7420	NRC
552	9-7434	NRC
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U		
8710	9-4804	
10825	9-116	See NP-1959
10895	9-4847	
13876	9-1041	
15991	9-941	See EES-6C101730
21676	9-4430	See HE-150-86
22817	9-4805	
22916	9-1267	
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23	9-3370	
25	9-3938	
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Report	Abstract	Availability
USNRDL-TR		
34	9-5246	
35	9-6406	
36	9-5213	
37	9-4668	
40	9-5261	
42	9-7186	
44	9-5573	
45	9-4913	
46	9-6156	
48	9-7456	
49	9-7408	
50	9-7409	
52	9-6592	
53	9-7233	
54	9-7234	
55	9-7611	
WAD		
1774	9-4807	
WAD/R (British)		
104	9-5599	See CI/R-72
WADC-TR		
52-51(Pt. 1)	9-3181	
52-51(Pt. 2)	9-3182	
52-51(Pt. 3)	9-191	
52-67	9-1820	
52-143	9-1532	
52-145(Pt. 2)	9-3516	
52-145(Pt. 3)	9-3517	
52-191(Pt.2)	9-5898	
52-191(Pt.3)	9-4952	
52-197(Pt. 1)	9-1487	
52-197(Pt.4)	9-4953	
52-232	9-4808	
52-252	9-7746	
52-307(Pt.1)	9-5061	
52-322(Pt.2)	9-5663	
53-5	9-6956	
53-71	9-2296	
53-83(Pt.2)	9-7320	
53-84	9-3868	
53-101	9-3518	
53-151	9-3519	
53-182	9-3520	
53-184	9-2238	
53-190(Pt. 2)	9-2740	
53-194	9-3578	
53-201(Pt. 5)	9-1252	
53-211	9-2335	
53-254(Pt. 1)	9-2297	
53-272(Pt. 2)	9-6289	
53-274	9-3869	
53-293(Pt. 5)	9-4419	

Report	Abstract	Availability
WADC-TR		
53-308(Pt. 1)	9-3386	
53-325	9-4706	
53-336(Pt. 1)	9-3521	
53-336(Pt.2)	9-5664	
53-336(Pt.3)	9-5062	
53-337(Pt. 2)	9-4420	
53-436(Pt. 2)	9-4421	
53-451	9-3522	
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54-88	9-3523	
54-100(Pt.1)	9-4988	
54-101	9-3524	
54-109	9-6263	
54-112	9-1268	
54-120	9-4185	
54-137	9-7274	
54-157	9-5311	
54-175(Pt.1)	9-7786	
54-183	9-6666	
54-185(Pt. 1)	9-1504	
54-195	9-1269	
54-205	9-2298	
54-212	9-3457	
54-222	9-3870	
54-244	9-975	
54-248	9-6689	
54-264	9-4707	
54-270(Pt. 1)	9-5361	
54-278(Pt. 1)	9-7004	
54-278(Pt. II)	9-7357	
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54-418	9-6336	
54-433	9-3799	
54-485(Pt. 1)	9-6291	
54-490	9-5065	
WADC-TR		
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54-576(Pt.1)	9-4981	
54-589	9-6293	
54-595	9-7358	
54-616(Pt. 1)	9-3183	
55-30(Pt.1)	9-5934	
55-30(Pt. 3)	9-2795	
55-57	9-4961	
55-102(Pt. 1)	9-4422	
55-187	9-5926	
55-193	9-4954	
55-213	9-5066	
55-221	9-6188	
55-240	9-6882	
WAL		
13	9-4780	
120/73	9-4104	
142/59	9-5992	
401/65-37	9-1271	
401/68-44	9-977	
401/68-47	9-1533	
401/84-41	9-978	
401/84-42	9-5665	
401/84-55	9-7787	
401/93-35	9-5666	
401/97-34	9-7005	
401/98-37	9-639	
401/109-29	9-4810	
401/143-11	9-7788	
401/147-21	9-4463	
401/203-3	9-1534	
401/203-4	9-5964	
401/203-55	9-7789	
401/207	9-5427	
401/214-2	9-4187	
401/215	9-5667	
401/216	9-2299	
401/230	9-2386	
801/6-25	9-4188	
821/9	9-1535	
844/18	9-4247	
844/18-1	9-5117	
WCLP-TN		
54-235	9-6196	
WCRT-TN		
53-178	9-7790	
54-32	9-5976	
WHC(C)/P (British)		
35	9-5193	See RD(R)-8134
36	9-5194	See RD(R)-8135
37	9-6808	See RDB(R)-8140

Report	Abstract	Availability
WIS-ONR		
12	9-235	
WSL/M (British)		
181A(Prov.)	9-7695	
XMPDC/P (British)		
5	9-6182	See RDB(C)/TN-131
XMPDC/P (British)		
YD		
54-21	9-6955	
YE		
54-530	9-3872	
54-541	9-3873	